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EDITORIAL NOTES.

Gas and Electrical Industries' Joint Conference on the Coal Situation.

IF representatives of the Government had been at the conference of the gas and electrical industries, at the Institution of Electrical Engineers on Thursday last, they would undoubtedly have been much impressed by what they saw and heard, and would have recognized that the coal question is not only a vital one to the industries, but through the industries to the nation—even to the Government themselves. In the interests of the nation, in the interests of their own reputation, the Government cannot allow the two industries to continue suffering in the matter of supplies and onerous prices. The industries are as necessary as any to the provisioning of the Army and Navy for carrying on the war to final conquest—particularly the gas industry, through being the source of some of the important ingredients required for the manufacture of explosives.

The conference, the speeches, the resolutions, the strong representative deputation of gas and electrical men who are going to seek interviews with members of Parliament so as to place the position before them, must each and all have weight with, and respectful consideration from, the powers that be. As to the conference itself, the Lecture Theatre of the Institution of Electrical Engineers was full to overflowing. Sitting accommodation and standing room were severely taxed (the "Iron and Coal Trades Review," on belittlement intent, very stupidly speaks of a "few gentle-"men" having been present). The representatives of the two great interests cordially massed together on Thursday in common mission stood for millions upon millions of capital, for a vast army of labour, for an immense volume of employment, and likewise for an immense volume of public service. It was not only representative but impressive when one considered all that it meant, and all that the two industries are to the country. It was well said by the Chairman of this unique assembly (Sir Corbet Woodall, D.Sc., who was supported on one side by Sir John Snell, the President of the Institution of Electrical Engineers, and by Mr. John Bond, the President of the Institution of Gas Engineers) that it might appear to be a severely commercial gathering for commercial ends; but it was far more than that. There was not a single man there who was not perturbed in mind by larger considerations than the one of mere profit-making. The very uniqueness of the conference is expressive of the gravity in which the general coal position is held by those responsible for the conduct of the two industries, and of their view as to the urgency for something definite and effective being done to give relief, and to guard against the heavily menacing conditions. This gravity and urgency were visualized in the speeches.

The causes of the situation in respect of coal supplies that has created so much consternation in the two industries are well known to their responsible heads. It is quite true, as was pointed out by the Chairman, that some of the difficulties have been modified—such as the congestion on railways and high freights for steamers. But there is no confidence that this modification is of an enduring character. While speaking of coal deliveries, it was good news to hear that some important electricity undertakings have been well cared for through the crisis by their coal contractors. On the other hand, some of them certainly have not, judging from announcements made earlier in the year, that certain concerns could not possibly "carry-on" unless there was an improvement in coal deliveries; judging, too, from the efforts made to impress upon the Government, the colliery owners, and the railway companies the need for hurrying forward supplies; and judging further from the action of the Government in using their influence to get supplies for hardly pressed electricity concerns serving factories engaged upon Government work. We have to freely acknowledge the strenuous efforts made by some coal factors in obtaining coal for gas-works; but we cannot shut our eyes to known facts in connection with other coal contractors. However, it is hoped that, at all events, railway and freight questions are things of the past, and that the Government will do something to ensure that there will not be a recurrence of similar paralyzing severity during the continuance of the war.

At the moment, the two most exigent questions are supplies and prices. They bear one on the other. The concisely worded passage from Sir Corbet's opening address "We are faced by a coal famine" is indeed significant, and must stir up concern in the minds of all responsible beings who look beyond their current needs to the prospects of the future. It is a point, however, for thankfulness, that this famine, "unlike famines due to natural "causes, is preventable, and ought to be dealt with." Whose business is it to deal with it? That, assuredly, of the Government; for it is notorious that, "if the miners "would only work longer hours to fill up the gaps made by "those who have left for the war, there would be no de-"ficiency." Stimulation can only come from the highest and most influential quarter. The serious part of the shortness of coal is not that it is affecting immediate requirements, but that it is interfering with the accumulation of large stocks for next winter—reserves held prior to the recent supply crisis having been heavily drawn upon, and in some cases exhausted. So much so has this been the case, that Alderman Kay declares that the Manchester Gas-Works are now in a worse plight in regard to stocks than they were in after the coal strike of 1912; and for this position there is no real justification. Other representatives of gas undertakings said much the same thing. The Government have taken one rational step in helping to relieve the position by prohibiting (without licence) the export of coal other than to British Possessions and Protectorates and allied countries. But, while this is good so far as it goes, it is not enough. They will have to do something more; and that something can be done by bringing influence to bear upon the coal-owners and the miners.

There is, too, the question of coal prices. Sir Corbet reiterated the point he made long ago as to some limitation being put upon the profits of colliery and royalty owners. Prices have advanced considerably—much more than the increased costs of production warrant; and the evidence accumulates as to concerted price-fixing in coal circles. Mr. Alderman Hall, of Workington, alluded to it at the conference; and, if the Government require more information than was given in the report of the Board of Trade Coal Committee as to agreements in the fixing of prices for coal, he can advance some of an incontrovertible character from Cumberland. However, the position to-day in regard to the depletion of coal stocks and the ability to replenish them is much worse than after the national coal strike. The buying that will have to go on to make up stocks to the amount prudently necessary to protect against the possible conditions of next winter will be, unless there is regulation by the Government, used as a reason for still further heightening prices; and the uncomfortable situation is accentuated by the fact that the coal put by for reserve will be at these heavy prices.

The resolutions passed by the conference supply the Government with ample indication as to how they can act to improve the position, as well as ward off the evil consequences of allowing things to pursue the present course, and of treating the matter as though it will right itself unaided under circumstances threatening to go from bad to worse. There was approval of the action of the Government in limiting exports. To meet current requirements and make provision for the heavy coal-consuming months of next winter, the submission is made to the Government that they should take further and immediate steps to increase the output of coal from the pits, to give greater facilities for the

transport of coal by rail, and to have regard, in requisitioning steam-colliers, to the requirements of public utility undertakings which depend for their supplies on seaborne coal. The Government are also desired to take such steps as may be necessary to reduce the price of coal to within reasonable limits. The Coal Committee of the Board of Trade made the same point; and yet we do not think the Committee were fully informed as to how stock-exhausted conditions were (as after the strike of 1912) playing into the hands of the colliery owners to fix what prices they like—unless the Government intervene in a manner which will produce a compulsory reasonableness. Then came the resolution appointing the strong representative deputation to have an interview with members of Parliament. All the resolutions are to the point; and we hope that good will issue from the conference. It will not be the fault of the gas and electricity industries if it does not. The whole character of the conference gives strength to those who are working to the end of securing relief from a condition of things which, as it stands at present, is without doubt (despite all protestations to the contrary) largely due to a fine regard for opportunism and the indulgence of selfishness—selfishness not only on the part of colliery and royalty owners, but of the short-working miners.

An Exposure—Experiences with a Coke-Grate.

THERE is no definite relationship in the two parts of the above title; but they formed the first and last subjects in a composite paper read by Dr. A. Vernon Harcourt, F.R.S., one of the Metropolitan Gas Referees, before the Royal Society of Arts last Tuesday. Though the elements composing the paper had each a distinctiveness, the author—old master that he is in chemical and physical sciences—was able to synthetize them in such a manner that one was led from the imposition on public credulity to the antithesis of a very real public economy and gain, as exemplified by the author's personal experiences of the use of coke-grates in the home. We have all seen advertisements which held out to the public the prospect, by effecting a purchase of something of miraculous property, of making (say) one ton of coal treated by it stretch out to the corresponding service of two tons of untreated coal. All purveyors of fuel—gas undertakings as traders in gaseous fuel and coke—are interested in these attempted impositions, because, if there was truth in the advertisements, the fuel business other than that of the coal merchants would be irretrievably doomed. However, the secret of how the miracle is performed is contained in a little box which is placed in the possession of the credulous who part with their money in making the purchase. The analytical chemist can cause the box to reveal its secret; and Dr. Harcourt has done so, with the result that he makes public in this paper the fact that people who purchase a box of the stuff are paying very dearly for what in large part is common salt, mixed with small percentages of calcium carbonate, ferric oxide, and silica—the trifling balance being water. The details of the exploration made into the use of the powder are given in the paper with a delicate sarcasm; and if these details could be accorded the same circulation as the advertisement of the wonderful virtues, in developing the efficiency and economy of solid fuels, of salt and the other elements in the powder, the death-blow would be given to the imposition. We will not spoil the reading of Dr. Harcourt's exposure by further indicating its nature; but it would be interesting to see the manner of scientific man that those responsible for trading in this direction on public simplicity would put up against the authority of their accuser.

In carrying out his experiments with this wonderful powder, the author desired to measure the radiant efficiency of fires fed respectively with treated and untreated coke; and, for this purpose, he devised what he calls a "radio-" thermometer." We rather fancy that Dr. Harcourt is not fully abreast of accomplished modern work in connection with the devising of instruments for the measurement of the radiation from fires. But there is this to be said, that he had clearly got on to the same road in the matter of design as the technical staff in the Richmond Gas Stove and Meter Company's laboratories, with the difference that the radio-thermometer appears to be somewhat crude, while that of the Richmond Company appeals as having been designed with studied regard to the securing of accuracy. Although Dr. Harcourt has taken some precautions to prevent loss of heat from exposure of the casing of his instrument to the air of the room in which it is used, it seems to us that there must be an appreciable amount of cooling from the casing surface. With the Richmond instrument, the cooling correction applied is about 8 per cent. of the observed temperature rise of the metal block. It would have been interesting if the author had shown (as suggested by Mr. Harold Hartley in the discussion) what concordance he obtained with his instrument in successive tests with the same fuel; and further to what extent the results would have been modified by arranging the stirring of the water to be done every two minutes and every five minutes, as well as at the ten-minute intervals adopted. Referring to the table in the paper, it will be seen that the temperature of 57° Fahr. of the water (which was that of the temperature of the room) was obtained after approximately 33 minutes, during which period the vessel was below the room temperature, leaving 27 minutes during which the water was above the room temperature. So that the cooling corrections to be applied for each of these periods would not neutralize one another. The figures emphasize the experimental difficulties with which an experimenter is faced in endeavouring to estimate directly the radiant efficiency of a solid fuel fire. For example, it would appear that in these experiments the fire burned more rapidly during the second stage than during the earlier one. It seems quite clear that the radio-thermometer does not allow of the experimental accuracy which articles in our columns have suggested is obtainable with the Richmond radiometer, which we have brought into comparison through the partial similarity in the fundamental ideas that gave birth to both instruments. At the same time, it is recognized that the conditions in a coke-fire are not comparable in the matter of uniformity with those that exist during the burning of a gas-fire, for the testing of which a higher degree of accuracy is therefore necessary.

This brings us to the type of coke-grate with which Dr. Harcourt experimented. He is an old and very enthusiastic believer in coke for room-warming; and, in his residence, he has used coke-grates of his own devising for close upon half his lifetime. He believes in a vertically deep coke-fire; but not a deep fire from back to front. Coke, too, burning more freely than coal downwards, he lights his coke-fire at the top. The freer downward combustion is experienced especially with graded coke and with the coke from continuous vertical retorts. We cannot say that the coke-grates Dr. Harcourt prefers are pretty to look at; nor is the exposed surface of non-incandescent fuel until the fire burns down. We should have imagined, too, that, as the coke burns downwards, and passes (say) the central bars, the rate of combustion, and the ventilating effect of the fire, would have diminished owing to the ash partly choking the interstices between the coke. There is also the point that, with the gradual rise and fall in incandescence, the radiant efficiency of the vertically deep fire is a variable quantity—first ascending, then descending. We are not convinced that Dr. Harcourt has secured the best form of grate for coke use. However, the settings of the grates in his house relieve the appearance of the latter. The author's faith in coke is great—from the points of view of economy, radiant efficiency, and of public benefit in helping to maintain a clear atmosphere. This faith is thus expressed: "Weight "for weight with coal, coke has an advantage over coal for "domestic use; and I would retain it even if, through in-"creased demand, the price of the two were the same."

But we hardly think, in his cost-comparisons of the coke fire with the gas-fire, the author was altogether fair to the latter. He took a large fire, and a uniform maximum consumption of 35 cubic feet of gas per day, making no allowance (although he referred to the point in replying to the discussion) for reduction of consumption after the room is warmed-up by turning the tap, or by the use of a duplex tap, and keeping only one-half the radiants incandescent. One cannot deliberately "turn down" a solid fuel fire; it must diminish its activity by the process of natural exhaustion. Some of the speakers during the discussion urged the supply of cheaper gas for heating. To this, Mr. F. W. Goodenough (who was in the chair) made adequate response. Just what the speakers pleaded for, gas companies have been striving to give consumers—and successfully, until the war caused a reversal of the course of their beneficial operations. Differential prices for lighting and heating would not, with the majority of gas undertakings, be a happy policy at the present time, even if it were normal. It is recognized by those responsible for the policy of the gas industry that heating—both domestic and industrial—will form a still

larger proportion of their business in future. At the same time, the price of gas for lighting must be, for competitive purposes, reduced to the lowest possible level. Differential prices, too, would mean a large capital expenditure on duplicate meters and fitting; and consumers would be put to the expense of duplicate piping. In all the circumstances, the right policy is to work for, and to maintain, a low flat-rate for domestic purposes. The experience of the speaker with a circulating gas-heated water-boiler lacked full information as to the quantity of work done. If, in relation to work done, the cost was high, then there is a vast amount of testimony from consumers who are satisfied with the cost in their cases, and would not be without the convenience; and among these consumers are many people in the small middle-class houses of Suburbia who never have any money to waste. We were glad to hear the absurd results of so-called "efficiency" tests quoted for coal-fires during the discussion by Mr. L. B. Atkinson properly described by Mr. A. H. Barker, of University College. Dr. Harcourt, it will be seen, provided a highly interesting evening for those who were able to be present at the meeting last Tuesday.

Fruits from Seed Sown in Times of Peace.

If any large trading concern has cause for congratulating itself upon having adopted a good policy towards its employees in times of peace, that concern is the Imperial Continental Gas Association. The study of both officers and men, with a considerateness that has made them feel they are an integral part of the large organization, has been the continuous policy of successive Boards; and the result has been that, among officers and men, there are to be found representatives of families that have served the Association into the third and fourth generation. Working under Continental conditions, the Directors of the Association have been strict in their regard for native susceptibilities; and in looking after the welfare of their men and their dependants, they have never drawn a rigid line at the obligations imposed upon them by State enactment. What has been done in times of peace has borne fruit in those times, but better still it has borne, and is bearing, good fruit in these times of war and dislocation of international connections. Every bit of devotion and loyalty the Association want now from those who serve them, when property, business, and interests are all lying in countries that are at war, and for the most part where unapproachable by the members of the Board. The Association have strong evidence of this devotion and loyalty; and when the days of peace are restored, one of the brightest conditions of these months of anxiety and uncertainty on which to look back will be—though officers and men may be sons of a country with which we are at war, and patriotic to the backbone—the manner in which they have lived-up to the trust reposed in them, and have worked on, in the interests of the old Association, with regularity and conscientiousness, as though the cloud of war was not over the land.

From the chair on Tuesday last Sir Charles Jessel, Bart., had to tell the proprietors tales of heroism and devotion on the part of their officers and men in war-racked Northern France; of, so far as could be learned, normal working by the staffs, without the directing hand and brains of the Board, in Austria-Hungary and Bohemia; and of the same in Brussels and Antwerp so far as is known with all doors rigidly closed upon definite information from these two cities. And from Germany, where the largest interests of the Association are centred, came the best of intelligence that could have been anticipated in present circumstances. There was good substance and authority in the story. Sir Charles might—had the future not been cloaked with uncertainty—have told his tale with more colour in it. But what he did say was of a nature that must have had a composing influence on the proprietors. The record of, and the confidence built up by, the Association in Germany are standing them in good stead to-day. No greater testimony of this could there be than that Messrs. Jörger and Körting, respectively the Agent and Chief Engineer of the Association at Berlin, secured the consent of their Ministers to visit Amsterdam on two occasions for interviews with the Secretary of the Association (Mr. R. W. Wilson), who went there from London with the full knowledge and consent of our own Foreign Office; and the information they were able to give Mr. Wilson as to the property and course of business to March last is of a most reassuring character. Things are proceeding much as usual, of course under the supervision of the Authorities, and a strict account is being kept of all financial matters. Both in Berlin and Hanover there have been decreases of gas consumption; but the figures show they are of diminishing quantity.

Altogether, the speech made to the proprietors by Sir Charles Jessel (of which a verbatim report is given in our news columns) will be read with much interest by those who are pursuing gas making, distribution, and sale in this country under more agreeable circumstances. Outstanding in the Chairman's address is the evidence of devotion to the interests of the Association by their employees in the countries unhappily at war with our own. Said Sir Charles: "Their "loyalty to their country is not involved in the slightest "degree in their loyalty to this Association." Writing on the conduct of the men during the period of the war, Mr. Körting says: "Although I can say with good conscience it "has been my constant desire to do the proper thing towards "them, following therein the good example of our Directors, "I have been agreeably surprised by the general *esprit de* "*corps*." This is excellent testimony; and there we have the fruits, in unexpected days, of the seed sown in the times of peace. On this occasion, as six months since, a distribution of 2¼ per cent. is being made to the proprietors; but the Chairman had to warn them that this was the final distribution this side of the end of the war.

Stoke-on-Trent Salary Question.

The County Borough Council of Stoke-on-Trent seem to require a little guidance on the subject of the salary to be offered to the man willing to take the position of Chief Gas Engineer and Manager of their four works and distribution areas. This is a matter upon which comment was made in the "Journal" last week (p. 252). Some of the members of the Council, it will be remembered, inadequately appraise the value of the professional gas man's services, and the recompense he should receive for the responsibility he has to shoulder; and, as a consequence, the Town Council are proposing to economize by cutting-down the salary and other consideration first offered for a new chief for the Gas Department. The Town Clerk (Mr. E. B. Sharpley) has sent out a circular-letter to other municipal authorities possessing gas-works, asking for replies to certain questions regarding the salaries of their gas engineers and managers. We do not suppose that Mr. Sharpley, as a professional man, undertook this prying investigation into a personal matter concerning the remuneration of other professional men with any degree of pleasure, though, doubtless purely as a matter of form, he said that he would be "happy to reciprocate at any time." The questions he asked were: "(1) What is the annual salary of your chief gas engineer and manager? (2) What other emoluments (if any) does he receive? (3) What is the annual salary of your deputy gas engineer? (4) What other emoluments (if any) does he receive? (5) Quantity of gas made per annum?" In regard to the last question, the quantity of gas made is an insufficient criterion; there are other things besides sale of gas to be taken into consideration. To discuss them here, however, would take up too much time and space. But it may be said that Mr. Sharpley made a mistake in not extending his questions by three others: "(6) Has your engineer and manager four gas-works to manage, or only one? (7) Is your area of supply comparable with Burslem, Stoke, Fenton, and Longton? (8) Have you a majority of members on the Council who are inclined to be parsimonious, or a majority who are fair dealing, in paying for professional and responsible services?" It is far better for a Council such as Stoke-on-Trent to pay in excess of the fair value of professional services, than to be pointed at with contempt for pursuing a miserable cheeseparing policy in regard to salaries, and for doing a part in making the gas industry less attractive to the best men and the best brains.

Provisional Orders and Parliamentary Revision.

There were two or three features about the Gas Provisional Orders in the session of 1914 which gave a little relief from the usual monotony of this species of legislation; and these features receive attention in the Board of Trade report which has just been issued. The capital represented by the Gas Orders of the session was £389,000 share and £136,739 loan, and for water £52,500 share and £21,882 loan. The decisions of the Board in respect of the Orders are always subject to confirmation, rejection, or amendment by Parliament. Sometimes this is an advan-

tage; sometimes it is otherwise. It is quite possible that, if their Order had not had to be submitted to Parliament, the Swansea Gas Company would have got it through without amendment, as it is more likely than not the Board of Trade would have complied with the report of the Joint Committee on Gas Residual Products, and completely cancelled what was done in 1912 in regard to preventing the Company purchasing residuals from other gas undertakings. But the chemical manufacturers, having gained a one-third restriction in the South Suburban Gas Bill, turned up against the Swansea Order, and secured from a Parliamentary Committee the insertion of the same provision. This is an instance where it is a pity that the Order had to go past the Board of Trade for confirmation. On the other hand, a case in which it is fortunate that the Board were not the final arbiters is the Balcombe Gas Order, which proposed to deliver the district over to a petrol air-gas company. The Board granted the Order. A Committee of the House of Commons, however, looked upon the general supply of petrol gas as something in the nature of a makeshift, and consequently made provision for the Hayward's Heath Gas Company giving the inhabitants the advantage of a supply of coal-gas, which is not to be sold at a less price than in the rest of the Company's area. Within twelve months of the passing of the Hayward's Heath Gas Act of last session, the Petrol Gas Company may call upon them to purchase their pipes. In the Balcombe Order, for the first time within our knowledge, an incandescent gas-burner was prescribed as the standard burner for gas testing. But the burner was not very strictly defined. The report says the petrol gas "is to have an illuminating power of 35 candles, when burned in a mantle with a suitable burner." The Board effectually strangled the aspirations of the City Oil Syndicate, Limited—whoever that body may be—to obtain powers, through the Calvert (Charndon) Order, to bore for, and to confer upon, Twyford and Charndon in Buckinghamshire the asserted blessings of a supply of natural gas, about which there was a good deal that was highly speculative. This was apparently the view of the Board. The other Orders were quite of stock character.

The Miners' War Bonus.

The claim of the miners for a universal war bonus of 20 per cent. has not met with the sympathy of the Prime Minister. He agrees that a *primâ facie* case has been made out for an immediate advance in wages; and that it shall date from the 5th inst. But he has been much impressed with the contention of the coalowners that the question of the amount of the advance depends upon local conditions; and therefore he has decided it should be left to the decision of the existing District Conciliation Boards and Sliding-Scale Committees. The Miners' Federation have therefore recommended each area to at once put forward before the District Boards and Committees their claim to a 20 per cent. advance. We are not yet out of the wood in connection with this matter.

A Sign of the Times.

Of all the problems which have been created by the great European war and its necessary consequences, the fact has been brought home to manufacturers and their customers that the question of transport is by no means the least. To put it mildly, railway facilities are inevitably not now what people in this country had become accustomed to; and so greater use has to be made of the roads. Happily there are motor lorries, and other vehicles of a like character, still available; and one hears accounts of quite formidable journeys being undertaken in this way to secure goods urgently required. Indeed, one of the features of the front page of each day's issue of "The Times" is just now their "Freight Exchange for Road Motors, &c." Here are to be found intimations—varying, of course, from day to day the precise nature of the requirements and offers—with regard both to loads desired and haulage wanted. Taking an issue of the paper at random, it is noticed that it contains fifteen of these announcements. Among the journeys advertised for specified dates [one of them no less than three weeks ahead] are Bath to Sheffield, and Brighton to London; while, on the other hand, haulage is—to mention some of the places—wanted between Birmingham, Cleckheaton, Sheffield, West Drayton, and London. The accommodation offered ranges from steam pantechnicons to 1 ton lots, and the goods which advertisers are desirous of having conveyed from one place to another are of quite as diversified a character. Glancing at this sign of the times, one is led to wonder how matters would have fared if there had been no such things as motors on the roads. Both for civil and for military purposes they have rendered possible very much that would otherwise have been absolutely impracticable.

Coal Export Prohibition.

After the report of the Board of Trade Coal Committee, the decision of the Government to prohibit the exportation of coal, without licence, to countries abroad, other than to British Possessions and Protectorates and allied countries, could not have been a surprise to colliery owners. The Order is to come into operation on Thursday. "Charity should begin at home, and we have just now nothing to give away in the shape of coal," said Mr. H. E. Jones at the conference of the gas and electricity industries last Thursday. Coalowners have only themselves to blame for what has happened. They were ready enough to proclaim the absence of miners at the front as a reason for shortness of coal and high prices at home, the while shipping coal to other countries as fast as they could, and in quantities which showed a lessening decrease on the quantity exported in the corresponding periods of last year. While our industries were straining to get coal, and were (with householders) being charged exorbitant prices, this feeding of other countries was proceeding—even, there is good cause to believe, to enemy countries *viâ* neutral ones. The note is a different one to-day. On one hand, we are told the profits lost on the export business will have to be paid by coal consumers at home. It is also said that numerous pits will have to be closed-down through the proposed curtailment of exports. There is not much fear of this. We again compare with interest these statements with the excuses so recently made for shortage of supplies. Now when the country's industries want to build-up their reserves, and provide for current requirements, there is not much likelihood of coal going begging at home. The power of absorption is great just now. Durham, it is said, expects to do a good export trade with Russia. As to the gradual month by month narrowing of the decrease between war period exports and the corresponding period of 1913-14, the April returns have been issued; and these show that the reduction on the export of April last year was only 1,459,882 tons. The average reduction for the five war months of last year was 2,721,750 tons; in January last this average decrease had dropped to 2,319,373 tons; in February, to 2,189,714 tons; in March, to 2,026,964 tons; and now in April (as mentioned above) to 1,459,882 tons. To say the least, the figures are significant. The total diminution in exports since the war started is 21,604,723 tons.

British Industries Fair.

A very considerable amount of enterprise has been shown by the Board of Trade in arranging the British Industries Fair, which is now being held at the Royal Agricultural Hall, Islington; and although the display has necessarily been confined to certain specified trades, its outcome will be carefully noted by manufacturers generally. Should the results prove to be so satisfactory as is hoped for, no doubt something of the same kind will be done for other trades which it has not been found practicable to include on the present occasion. The exhibition has been organized as a complement to the series held during the last few months at which samples of German and Austrian goods were shown, with a view to finding British manufacturers prepared to make goods to compete. Now we see samples of British goods in some of these trades. They are the product of about six hundred manufacturing firms; all the branches of trade chosen being those in which a large proportion of the goods hitherto consumed in this country have been imported from enemy countries. A point which it is only fair should be emphasized—inasmuch as it removes what might otherwise have proved an objection to the scheme—is the stipulation that admission to the fair is to be restricted to *bonâ fide* buyers for home and over-sea markets, and is by invitation of the Board of Trade. That is to say, the attendance will be made up of wholesale purchasers, who will find that every assistance is rendered by the Board, to enable them to carry through business. Interpreters have been engaged, special inquiry offices organized in each of the trade sections, and an office of the Commercial Intelligence Branch of the Board of Trade has been established in the hall, so that the fullest information on such matters as commercial statistics, customs tariffs, shipping and transport, commercial products, &c., may be at the disposal both of exhibitors and visitors.

PERSONAL.

Mr. W. W. DOUGHTY has been elected Chairman of the Tipton Gas Committee, in place of Mr. W. W. ROBINS, who has joined the R.A.M.C., and has gone to the front.

At last Wednesday's Quarterly Convocation of the Supreme Grand Chapter of Royal Arch Masons of England, Ex. Comp. WILLIAM A. SURRIDGE, the Treasurer of the Evening Star Chapter, No. 1719, was appointed to the rank of Past Grand Standard Bearer.

The Leeds Corporation Gas Committee have appointed Mr. THOMAS WENT as Superintendent of the Meter, Stove, and Stores Department, in addition to his present duties as Superintendent of Meter Inspectors, in succession to Mr. J. Templeton, resigned.

Mr. JAMES SIMPSON, J.P., C.C., was unanimously re-elected Chairman of the Hebden Bridge and Mytholmroyd Gas Board at the recent annual meeting. With the exception of one year, Mr. Simpson has been Chairman of the Board since its inception twenty years ago.

The Barrow Town Council have appointed Mr. FRED CHADDERTON as Manager of the gas and water undertakings, at a commencing salary of £350 per annum. Mr. Chadderton, who is thirty-four years of age, has been Assistant-Manager at Barrow for seven years, and he was previously eleven years in the service of the Oldham Corporation.

In the House of Commons last Thursday, Mr. Robertson, the Parliamentary Under-Secretary of the Board of Trade, stated, in answer to Sir Frederick Cawley, that Sir MARK OLDROYD had resigned the chairmanship of British Dyes, Limited, owing to ill-health, and that Mr. J. FALCONER, the Member for Forfarshire, had been elected in his stead.

Mr. G. STANLEY COOPER, B.Sc., of Cleckheaton, who has for three-and-a-half years past been Chief Chemist to the Koppers Coke-Oven and Bye-Product Company, Limited, of Sheffield, has been appointed to the managership of the tar distillation and sulphuric acid works of Messrs. Brotherton, Limited, at Workington. Mr. Cooper is a Fellow of the Chemical Society, and a member of the Society of Chemical Industry, and of the Institution of Mining Engineers.

We cordially join with the "Co-Partnership Journal" of the South Metropolitan Gas Company in offering hearty congratulations to Mr. F. J. BYWATER on his promotion to a Captaincy in the Royal Engineers, and to Mr. J. L. PENNEY, Lance-Corporal in the 1st Royal Berkshire Regiment, who has been awarded the Distinguished Conduct Medal for gallantry in the storming of an enemy position on Feb. 20, and for carrying a wounded officer, through heavy fire, from the German trenches.

The fact was recorded a month ago that Mr. W. H. MAINWARING, who had for a long time ably filled the position of Works Superintendent of the Lincoln Corporation Gas-Works, had been made temporary Manager of the undertaking, in place of the late Mr. John Carter. We are pleased now to be able to state that the City Council have, on the recommendation of the Gas Committee, definitely bestowed the appointment of Manager upon Mr. Mainwaring, at a commencing salary of £315 per annum. Applications are to be invited for the post of Resident Superintendent at the Bracebridge works of the Corporation.

Mr. W. STUBBS, Assoc.M.Inst.C.E., the Borough and Water Engineer at Blackburn, has intimated that, on account of failing health, he intends to retire at the end of the year. The General Purposes Committee of the Corporation, in accepting the resignation, placed on record their high appreciation of the energy and ability with which Mr. Stubbs has discharged his duties, and also invited him to superintend the completion of the reservoir at Wilpshire if the work is not finished by December next. Mr. Stubbs has held his present position nineteen years, having previously been Borough Engineer of Darwen for sixteen years. In Blackburn he has carried out many important schemes, including bridges, reservoirs, and improvements at the sewage works.

OBITUARY.

The death is announced of Mr. CHARLES WESLEY STOTT, Gas Manager, Birr, King's County, Ireland. He was the son of the late Mr. William Stott, of Cookstown.

On the 30th ult., the death took place at Harrogate, at the advanced age of ninety-one, of Mr. CHARLES ALLANSON. Deceased was for thirty years Chairman of the Harrogate Gas Company, and a Justice of the Peace for the borough.

The death occurred last Tuesday, at Greenwich, of Mr. WILLIAM CHARLES BAULF, aged 72. He was a chemist by profession, and was for many years in the service of Messrs. Hills, of Greenwich, and afterwards of the South Metropolitan Gas Company, but retired some years ago.

The death took place last Tuesday, at his residence at Littlehampton, at the advanced age of eighty-four, of Captain EDWARD HOLLAND HILLS, R.N., who for nearly forty years was Chairman of the Bognor Water Company, the affairs of which he controlled through many difficulties.

We regret to learn from Mr. Charles Hulme, the Engineer and Manager of the Uxbridge Gas Company, that news has been received that Lieutenant J. H. BROUGH, of the 8th Middlesex (T.F.), has died from wounds received near Ypres on the 27th ult. Lieutenant Brough was a pupil of Messrs. H. E. & F. H. Jones, and had been Mr. Hulme's assistant for the past five-and-a-half years. He was of happy disposition, and popular among those with whom he came in contract; and it is regrettable that a very promising career has been cut short. Lieutenant James Henry Brough was the son of the late Dr. James Murray Brough and Mrs. Brough, of "Tyn-y-groes," Uxbridge, and was twenty-six years of age. He had held a commission in the 8th Middlesex for some years, and was second lieutenant (under Captain J. A. Down) in the Uxbridge Company. When Captain Down left for further training, Lieutenant Brough assumed the command of the "E" Company, and under his direction the corps made very marked progress. Upon the battalion proceeding to Gibraltar, he was given the position of Acting Adjutant, and subsequently was appointed First Lieutenant. He was fatally wounded while in the trenches; his last words were an exhortation to "Keep on firing." Referring to him, a local paper said: "By Lieutenant Brough's death the Army, the 8th Middlesex, and Uxbridge have indeed lost a gallant and much-loved officer—one whose place it will be most difficult to fill."

Mr. THOMAS BOOTH FARRINGTON, who for many years had an extensive practice in Manchester and North Wales as an engineer, architect, and valuer, died at his residence at Llandudno on the morning of 2nd inst., at the age of sixty-one. Mr. Farrington was a native of Chorley, and was articled to Messrs. Maxwell and Duke, of Manchester. While in their service he laid out St. Anne's-on-the-Sea, in which work he was so successful that he was appointed Architect and Engineer to the Pwllycrochan Estate Company, of Colwyn Bay, for whom he laid out Colwyn Bay. After some years' residence there, he was appointed Borough Engineer and Surveyor to the Conway Corporation—an office he held for twenty years. He planned a water-works system for Colwyn Bay; and, the rapid growth of both towns making a larger water supply essential, he was engaged by the Conway and Colwyn Bay Joint Water Board as Engineer for the important works which they took in hand. He was the Cowlyd Board's Engineer up to his death. His ability and knowledge of water engineering led to an increasing demand for his services. He was in great request as an arbitrator; among the arbitrations in respect of which he was engaged being that relating to the Rivington Water-Works, in which he represented Sir W. H. Lever. He carried out water and sewerage schemes for many local authorities. He was an associate member of the Institution of Civil Engineers, a member of the Institution of Municipal and County Engineers, of the Gas Institute and the present Institution, of the Liverpool Engineering Society, and of the Llandudno Urban District Council. He was also a Freemason of distinction, occupying high rank as P.P.G.S.W. of the Province of North Wales. He was Senior Past-Master of the St. Tudno Lodge, Llandudno, and one of the founders of the St. Trillo Lodge, Colwyn Bay. He was a Director of the North Wales Gas and Water Corporation. Deceased leaves a widow, three daughters, and two sons. The funeral took place last Wednesday, in the graveyard attached to the ancient church of St. Tudno, on the Great Orme's Head, and was attended by a representative gathering, which included Mr. J. W. Broadhead, the Past Chairman of the Society of British Gas Industries, and Mr. Walter Shadbolt, the Gas Manager to the Llandudno District Council.

Mr. William Froggatt, the Chief Engineer at the Thorncliffe Iron-Works of Messrs. Newton, Chambers, and Co., Limited, whose death was recorded in the "JOURNAL" for the 16th of March, left estate of the gross value of £3802.

Photography by Gaslight.—Some good examples of photographs taken by gaslight are given in the "Progress Department" of "The Gas Age" (New York) for the 1st inst. They were obtained by the aid of a rack constructed by one of the fitters of the Brooklyn Union Gas Company. It is equipped with Welsbach reflex lamps and specially made "Photolite" mantles, which are stated to be higher in actinic value than ordinary ones. The number of lamps on a rack varies, of course, with the requirements of the photographer; but usually there are 27. They are all under control, singly or in groups, and when all are lighted there is consumed per hour about as much gas as is used by an ordinary range in an equal length of time. The rack is adjustable and portable, and may be installed anywhere.

American Gas Institute Proceedings.—We have received the "Proceedings" of the American Gas Institute for the past year. They occupy two bulky volumes of nearly a thousand pages each, and contain the papers, &c., submitted to the members at the ninth annual meeting, held in New York from Oct. 21 to 23, 1914, under the presidency of Mr. W. H. Gartley, whose portrait is given as a frontispiece. The technical matter, most of which has been noticed in the "JOURNAL," is fully illustrated; and the other contents of the volumes include notices of the life-work of deceased members, the constitution and bye-laws of the Institute, lists of the present members, and the accounts, reports of Committees, &c. The Publication Committee of the Institute have edited the contents of the volumes, which are published at No. 29, West 39th Street, New York.

THE NELSON AND SOUTHEND APPOINTMENTS.

Out of the short list of candidates for the position of Gas Engineer and Manager to the Nelson Corporation, rendered vacant by the removal of Mr. A. Morton Fyffe to Blackburn, Mr. Dugald Currie, the Gas Engineer and Manager to the Airdrie Corporation, has been selected. The successful candidate is the son of Mr. Dugald Currie, the Gas Engineer and Manager to the Corporation of Campbeltown; and he was for nearly five years in the Chamberlain's office in that town. He was articled to Messrs. Hanna, Donald, and Wilson, of Paisley, and in course of time became the firm's chief draughtsman. This position he relinquished to take that of Assistant Engineer and Manager to the Stirling Gas Company, which he held for three years. He was then appointed Assistant Gas Engineer to the Corporation of Belfast; but on the removal of Mr. David Vass to Perth, early in 1912, he succeeded him at Airdrie. Mr. Currie is a Past-President of the Western District Division of the Scottish Junior Gas Association, having filled the position in the session of 1909-10; and it will be in the recollection of our readers that he presided at the recent Informal Meeting of Scottish Gas Managers in Glasgow, and delivered an interesting and suggestive address. He is a member of the North British Association of Gas Managers, and also of the Institution of Gas Engineers, having been admitted into the latter body last year.

The position of Engineer and Manager of the Southend Gas Company, rendered vacant by the retirement of Mr. Frank Clark, has been filled by the appointment, out of 103 applicants, of Mr. C. S. Shapley, of the Neepsend works of the Sheffield Gas Company. The successful candidate was educated at the Taplow Grammar School, and was articled to the Engineer of the Torquay Gas Company, of which Company he was appointed Assistant Engineer and Manager in 1902. Two years later he obtained a similar position with the Nuneaton Gas Company; and in 1906 he became Consulting Engineer to Messrs. Schultz and Comins, who are the owners of a number of gas-works. In 1909 he secured the position of Works Manager at the Neepsend station of the Sheffield Gas Company, and about two years ago was appointed Assistant to the Chief Engineer (Mr. J. W. Morrison, M.Inst.C.E.). The Neepsend works have been completely reorganized; and this important work has been carried out under Mr. Shapley's personal supervision. He is still a young man, and we congratulate him on his success.

DEATH OF A WELL-KNOWN RATING EXPERT.

By the death, after a long illness, of Mr. George Humphreys-Davies, there has unfortunately passed away an Architect and Surveyor who was well known to the directors and officials of many of the gas and water undertakings of the country—particularly with reference to questions of local rates and Imperial taxes. Deceased, who was 66 years of age, died at his London residence on Thursday morning, the 15th ult.; and the last tribute was paid to his remains at Golder's Green Crematorium the following Saturday afternoon.

Mr. Humphreys-Davies was best known professionally as a rating surveyor, and more especially by those with whom he had come in contact over the question to which he had more especially directed his energies—namely, the exemption of machinery from rating. Previous to starting a practice in London, in 1887, as an architect and surveyor, he had practised in Newport (Mon.). In London he soon made up his mind in which direction he could best bring his energies to bear, and decided that the legal aspects of the rating law as applied to manufacturing premises employing machinery would afford the scope he desired. He was joint author with the late Sir Edward Boyle, Bart., K.C., M.P., of "The Principles of Rating." He was also the author of a number of papers read before technical societies.

From its inception in 1889 until recently, the deceased gentleman was Surveyor to the Machinery Users' Association, and in this capacity was responsible for the drafting of the Rating of Machinery Bill, which has been on many occasions before the House of Commons, but has hitherto been crowded-out by the pressure of other business. An Act modelled upon it was passed for Scotland in 1901. He was also very largely retained in assessment cases for collieries and for railway, gas, electric, water, and similar undertakings carried on under statutory powers. He acted for the South-Eastern and Chatham Railway, the Crowhurst, Sidley, and Bexhill Railway, the Surrey Commercial Dock Company, the Gas Light and Coke Company, and others, in the purchase of property under parliamentary powers, and was responsible for the schemes for rehousing persons of the labouring class who were displaced by the widening of the South-Eastern Railway line between London Bridge and New Cross, and by the extension of the Surrey Docks. Among the numerous gas companies for whom Mr. Humphreys-Davies' firm have acted may be mentioned the Gas Light and Coke Company, the Newcastle and Gateshead, Cardiff, Newport (Mon.), Swansea, Great Grimsby, Normanton, Walker and Wallsend, Brentford, Whitstable, Kidsgrove, Brynmawr and Blaina, York, and Malton Companies; and they have also advised the Corporations of Leeds, Stockport, Swansea, Chesterfield, Taunton, Wallingford, and other places, upon the assessments placed upon their municipal properties.

PROHIBITION OF COAL EXPORTS

To Foreign Countries other than our Allies.

The "Gazette" issued last Thursday night contained the following Order in Council: "That on and after May 13, 1915, the exportation of coal (including anthracite and steam, gas, household, and all other kinds of coal) and coke be prohibited to all destinations abroad other than British Possessions and Protectorates and Allied countries." It is notified that applications for licences to export to prohibited destinations must be made upon forms obtainable at the War Trade Department, No. 4, Central Buildings, Westminster. This application form requires various particulars to be given, and an undertaking that the applicant will use the licence solely for the export of coal or coke which is his own property, or the property of a person, firm, or company for whom he acts as a responsible representative.

As already announced in our columns, the Board of Trade have appointed the Right Hon. Russell Rea, M.P. (Chairman), Sir Douglas Owen, and Sir Richard A. S. Redmayne, K.C.B., a Committee to consider and advise on all questions relating to the exportation of coal and coke from the United Kingdom to destinations other than British Possessions and Protectorates, Allied countries, and Portugal. Mr. E. J. Elliott, of the Board of Trade, is to be the Secretary. Questions relating to export to Portugal have been excluded from the terms of reference at the request of the Chairman, owing to his commercial connections with that country.

ELECTRICITY SUPPLY MEMORANDA.

We were asked the other day to illustrate the point which has been made in these "Memoranda" more than once that, under the system of charging by a fixed payment on the assessment of the property supplied, *plus* a secondary charge per unit for the current, a user of electricity for lighting, cooking, and heating obtains an undue preference in respect of his lighting units over the man who, under that or any other system of payment, is a user of current for lighting only. Let us suppose that 12½ per cent. is the fixed charge on the rateable value of the premises, that the rateable value is £60, and ½d. per unit the secondary charge. This will mean a fixed primary payment per annum of £7 10s. Let us next assume for illustration only that consumer "A" uses per annum 300 units for lighting purposes and 2000 units for cooking and heating. The secondary payment for the 2300 units at ½d. would be £4 15s. 10d.

Preference under the Assessment System.

£7 10s. 0d. + £4 15s. 10d. = £12 5s. 10d. ÷ 2300 = 1·28d. per unit.

Now consumer "B" in a house also rated at £60, we will assume likewise draws upon the mains for lighting to the extent of 300 units, which at ½d. per unit would cost 12s. 6d. This is what consumer "B" has to pay per unit for lighting purposes:

£7 10s. 0d. + 12s. 6d. = £8 2s. 6d. ÷ 300 = 6·5d. per unit.

In other words, consumer "B," because he does not use current for cooking and heating, has to pay for his lighting units 5·22d. more per unit than consumer "A." In other words, consumer "A" receives preferential treatment for the corresponding supply of lighting because he also uses current for cooking and heating; and in the Long Eaton case it was held that any one power consumer must not be allowed a preference in price for his power units because he is also a user of current for lighting—in other words, that another power user though not employing current for lighting is entitled, in similar circumstances, to power units at the same price as the other manufacturer. We seem to remember that Mr. A. H. Seabrook once said in a London newspaper that the whole of the fixed charge fell upon the lighting units. We do not think he could legally sustain the contention. If it were true, then it follows that all the units not used for lighting are supplied free of fixed charge and at ½d. per unit. Unless, therefore, the current used by other people for cooking and heating is supplied at ½d. per unit (whether or not they are lighting consumers, and whatever the system of payment), the man under the assessment system would be getting his cooking and heating units at a preferential rate. With the Long Eaton case before us, we cannot avoid submitting that, under the assessment system of charging, the user of current for lighting, cooking, and heating obtains his lighting units at a preferential rate compared with the man who employs other systems of cooking and heating.

Power and Power-Lighting Consumers.

There was a discussion lately in the Bedford Town Council on the subject of a special agreement with Messrs. W. H. Allen, Son, and Co., for the supply of electric energy to their works. Incidentally, in their report, the Electricity Committee recommended that the tariff for general lighting and for power, heating, and cooking purposes should remain as at present; but for power and lighting combined, manufacturers taking 300,000 units and above per annum should be charged 1d. per unit, subject to a scale of discounts if the account be paid within the time-limit stated (approximately one month),

varying from a deduction of 2 per cent. for a load-factor of 12 per cent. or over, to a deduction of 20 per cent. for a load-factor of 20 per cent. It seems from this that the Committee are making a distinction here between power consumers who use power only and those who use electricity for power and lighting, and that they are giving the latter preferential consideration—that is to say, are charging 1d. per unit for both power and lighting, with discounts, while consumers who are equally as good as lighting consumers, and consumers who are equally as good for power, are charged higher prices for the "corresponding" supplies. This is something that the law prohibits. The report before us may not be telling us the full tale; but anyway the members of the Bedford Electricity Committee should read the judgment in the Long Eaton case, and the views of the Court of Appeal on it.

The Half-Watt in America.

The misnamed "half-watt" lamp has something for which to thank the European upheaval. The circumstances created by the war have brought the lamp into larger use with greater speed than would otherwise have been the case. It would, under normal conditions, have had a comparatively slow growth in its primary mission of displacing electric inefficients, and in helping to give to shop and other people using the indirect and semi-indirect systems of lighting a larger volume of illumination for the money spent on current, though, of course, the lamps themselves are expensive in first cost. From the "Electrical World," some information is quoted by "Electrical Industries" which shows that in America the half-watt lamp has been busy displacing in the streets inefficient types of carbon arc lamps, both open and enclosed; and, owing to the fact that America, like Great Britain, had imported most of the carbons for flame-arcs, the half-watt lamp has also been brought into service in lieu of this variety of lamp. But the "Electrical World" is not altogether in favour of this supersession of the flame arc lamp. Its efficiency is higher than that of the half-watt lamp; and it has a more distinctive character. In America, it should be explained, white flame arcs are now commonly used. "The white arc lamps," says their American worshipper, "seem to belong to the street itself, while the yellowish incandescent units seem to melt into the general illumination along the way, without possessing an individuality of their own." We rather think that the primary purpose of public lamps, to give a good even illumination in the streets, without glare (which is a defect of the half-watt lamp unless encased by subduing means), should have preferential consideration over the point as to the individuality of lamps, which individuality is marked in the case of flame arcs by light oscillations and wide divergencies in light and shade unless the lamps are placed in costly proximity one to the other. "Electrical Industries" thinks that the "subtle shades of æstheticism" that appeal to our American contemporary will not affect the illuminating authorities on this side of the Atlantic. It also urges illuminating engineers to see that the "new illuminant"—that is to say, the half-watt lamp—is used in "the most effective way." In view of their dangerously high intrinsic brilliancy," we would insert before "way," the words "and correct."

Rating of Lamps.

This subject was recently discussed by the Illuminating Engineering Society, and was commented upon in our editorial columns on March 30. It will be remembered that the manufacturers of electric-lamps of the metallic filament types are anxious to base their ratings and markings on wattage, and not on candle power. Our contention is that ratings and markings should be on a basis that denotes to the user the actual value the lamp will give in terms of what he requires—that is to say, illumination. The only rational basis therefore is candle power. An article on the subject by Mr. S. M. Powell has appeared in the "Electrical Review;" and it coincides very much with our views. He holds that, while it is convenient from the manufacturing standpoint to adhere to a fixed watt-rating, it is neither desirable nor convenient from the user's point of view. It is probable that consumers will demand a candle-power rating; and it will be in the best interests of progress to fall in with the consumers' wishes. Safe it is to say, that gas-lamp manufacturers will continue to state not only the maximum consumption of a lamp, but they will distinguish between the sizes of their lamps in terms of candle power. To depart from popular identification expressions to mere terms of lamp input looks as though the electric-lamp manufacturers have something to hide. Returning to Mr. Powell, he thinks it is quite illogical to expect a user to get into the way of thinking of lamp sizes in watts, while a candle-power figure does bear directly on what a user wants—light. No one thinks of rating a gas-engine on the cubic feet per hour it requires—say, running at full load. What the user wants is an engine that can supply him with a certain amount of power; and he always speaks of it as a such-and-such horse-power engine, not as a so many cubic feet engine. Mr. Powell is of opinion that wattage is not any more exempt from abuse on the part of the manufacturers than candle power. There has been a good deal of experience of abuse in both respects in connection with the electric-lamp industry—*e.g.*, 1 candle per watt for metallic filament lamps; 1 candle per half-watt for the latest comer in the electric incandescent category. Both statements, as the photometer proves, are fabrications. One other point. Mr. Powell says the specification and design of illumination schemes on a basis of watts per square foot of floor area is piling one absurdity on another. So we say.

From the Sublime to the Ridiculous.

An article on "Special Industrial Heating" has appeared in the Commercial Section of the "Electrician." These are the weighty sentences with which the subject is introduced: "The economic aspect of electric heating, both of rooms and water, is in great measure bound up with factors which are introduced by commercial expediency. The essence of economic production under present-day conditions is made up from the elements of uniformity in design and quantity in production." The glory of these passages may stand without comment. But it is seen as we pass on that the "essence" of economic production should have included another element—that of simplicity. Simplicity must enter into the design where the product is to be turned out in gross lots. And electrical appliances suffer from an inherent incapacity to get down to simple lines of construction. However, we came across remarks which suggest that gas-heating appliances owe their commercial success to simplicity. We might add "and economy and efficiency." The electrical writer anticipates that "it will be many years before manufacturers of electric-heating appliances can undertake production upon a quantity basis, although they are making every effort to do so at the present time." The writer proceeds to pat the manufacturers on the back for making these efforts; and, being of prophetic disposition, he assures them that their efforts will ultimately bring about success. But then he cloaks an accusation of shortsightedness by saying that "it is not surprising that, in view of the attempts at uniformity, present-day manufacturers of electric heating apparatus are disinclined to devote any attention to special applications of electricity for heating purposes." We do not see why "attempts at uniformity" should keep manufacturers from following the line of least resistance. They must be wholly blind if the writer is a dependable person. He sees what evidently the electrical manufacturers do not see; for he says there is "*abundant evidence* of the existence in a great number of industries of a *crying need* for a simple method of heating which does not depend upon any process of combustion." Not only therefore are electrical manufacturers found to be blind to the bulky evidence, but their ears are also closed to the "crying need." This must be a painful revelation to the manufacturers. It will be remarked from this that the descent of the writer is by a series of easy stages to the ridiculous, which finds expression in this: "The few installations of special industrial electric heating which are to be met with have been put down more by chance than as the result of any special campaign by the manufacturers themselves. Almost in despair at the high factor of illness among his employees, the factory owner who uses gas for subsidiary heating purposes has come to hear that there is such a thing as electric heating, and upon making inquiries has adopted it, with profit to himself, and advantage to the health of his workers." The silly suggestion contained in this statement has set against it the immense adoption of industrial gas heating during the past few years, and the large extensions made by factory owners who have had experience of its economy and conveniences—the speeding-up of factory output, the regularity and adjustability of temperatures to any degree, the improvement of output, the prompt starting to work, no stand-by losses, &c. We advise the writer of these stupid allegations as to the ill-effects of gas heating, and the insinuation he makes that gas is merely used for "subsidiary" purposes, to read Mr. H. M. Thornton's recent paper before the Society of Arts, as published in our issue for March 23. If the writer of the article—who appears to have got his intelligence on the subject into a somewhat disordered state owing to Mr. H. Tomlinson Lee, of Wimbledon, having "undertaken the conversion of a number of presses in a box factory from gas to electric heating, and has succeeded in doing this in an extremely simple manner"—does not, after reading the paper, think that, with the mass of evidence against him, he has written very foolishly, then his capacity for appreciating facts must be of a very feeble order.

Power Supply.

Mr. Ernest T. Hollis has contributed an article to the "Electrical Review" on the case for the electrification of engineering works; but the case seems to be lacking in backbone. He starts off by complaining that the opponents of such electrification seek to make out their case on low power costs. It seems to us to be a very good starting-point indeed from which to carry conviction to a factory owner. But like Mr. Hollis, we were never highly enamoured of those mural advertisements that used to catch the eye at almost every railway station, and which asserted that, by means of somebody's suction-gas plant, 10 B.H.P. per hour could be obtained by the expenditure of a penny. There were certain omissions in connection with the claim that had to be rectified in the interests of town gas. However, manufacturers have had their experience, and town gas is returning to its own. Mr. Hollis states that electrical engineers also found it difficult to make headway with power against these assertions; and then they only did so by forcing upon owners of engineering works the realization of the large losses incurred in line-shafting. One lesson of recent experience is that it is no use talking of theoretical costs per B.H.P. hour, but what has to be ascertained is the relative amount of work that can be done by an electric-motor and a gas-engine of the same reputed horse-power. Where machines are scattered about a factory, and cannot be connected-up to a line of shafting, and small electric-motors will meet requirements, we give them

the palm for convenience—nothing else—under the circumstances. The author of the article mentions what he regards as the individual merits of the electric-motor. In greater part, these merits refer to the gas-engine equally with the electric-motor. But shafts and gearing appear to be his strongest point; and he fairly admits that these cannot in cases be altogether eliminated with the electric drive. We have an illustration from a factory in which the cost of a number of small electric-motors was so considerable, and complaint was in consequence so severe and persistent, that the local electrical engineer proposed to put in a large electric-motor, and drive the machinery from a line of shafting, in order to save cost. A gas-engine with town gas was able to beat the electric-motor in working cost; and it is doing the work to-day. One of the other advantages named by Mr. Hollis is the increased safety of operators. Too much should not be made of this, until it is possible for the electricity industry to suppress the annual report of the Chief Inspector of Factories and Workshops. Then we learn that shafting and gearing obstruct light. This would apply to any form of power driving shafting—if it were not possible for sensible lighting plans to be carried out. Mr. Hollis omits to point out the awkwardness for factory owners relying on electric-motors when the supply of energy suddenly fails. At the end of the article, there is the frank admission that where 1d. per kw.-hour must be charged, it is no use telling small users of power that electricity can compete with low-priced gas.

NOTES FROM WESTMINSTER.

A FEW points from the Parliamentary Committee Rooms fall for notice this week.

Fittings Contractors and Corporation Work.

Under somewhat exceptional circumstances, the old question of fittings work was again argued before Lord Newton's Committee last week, in connection with the Plymouth Corporation Consolidation Bill, which measure is the sequel to the amalgamation of Devonport and East Stonehouse with the borough of Plymouth. The Devonport Gas-Works passed into the hands of Plymouth on the amalgamation; and the defunct Corporation possessed powers to sell, hire, and maintain gas-fittings, and generally do fitting work. This power was secured by Devonport in 1901; and it was quite in conformity with the model terms at that date. The model clause has since undergone revision; and under the new form local authorities are compelled to do the work through local contractors, and to see that business of this kind pays for itself. This was encouragement to the Plymouth Mercantile Association to try to get the old powers converted to the new style, although they are only required for the Devonport area. But it would have been grossly unfair, after a business and policy have been constructed on authorization granted by Parliament years ago, to have now altered the terms. There would have been no suggestion of any change had the gas undertaking remained in the possession of the Devonport Corporation; and, on the amalgamation, it would not have been an act of legislative justice to have varied the authorization as suggested by the Plymouth electrical contractors. Lord Newton and his colleagues were obviously of this opinion, and refused to vary the old powers as suggested. One point made to the disadvantage of the local firm of contractors was that, when the work of maintaining prepayment installations was done through them, the cost averaged 4s. 8d. per installation a year, whereas now the average is only 6d.—the saving being some £2500 a year. Of course, the contractors shielded themselves behind the point that it is a far cry to the time when they did the maintenance; and it can now be done much cheaper. Our electrical friends will be highly elated in a decision of the Committee regarding a matter over which there has been much wrangling between municipal supply authorities and local contractors. Full powers were also possessed by Devonport respecting business in electrical fittings and wiring without the intervention of a contractor. The Plymouth Corporation not only asked for the transfer of these powers, but that they should be stretched to cover the whole of the Plymouth and Stonehouse areas. The Committee granted the desire of the Corporation, much to the chagrin of the local contractors. This will be heralded by the electricity supply industry as a good omen for the future. It will also spur the Electrical Contractors' Association to fresh effort in opposition. There is the model clause too to be got over by electricity suppliers; and the insertion of this will be insisted upon in the case of all authorities applying for the powers for the first time. The Plymouth case was an exceptional one, owing to the pre-existence of the powers at Devonport; and there was an excuse for not having powers of diametrically opposite character in two parts of the same borough. That Parliamentary Committees will, as a rule, compel the adoption of the Model Clause is again evidenced by the action of the Local Legislation Committee in rejecting, in the case of the Lincoln Corporation Bill, a proposed variation agreed upon with the Electrical Contractors' Association, and in inserting the Model Clause.

Corporations and Gas-Mains.

It is a pity when local authorities decline to recognize that other people besides themselves have a right to adequate protection for property under the road surfaces, and when they pursue a course of action that suggests the "dog-in-the-manger" spirit, and a refusal to recognize that statutory companies are performing public service as well as themselves. Among those engaged in public services, there should exist a spirit of mutual tolerance and helpfulness within reason. The Wolverhampton Corporation Bill proposes certain new water-works, which include the construction of an aqueduct through a long stretch of rural roads in which the Wolverhampton Gas Company also have mains. The Corporation proposed the adoption of an ancient clause—one which had birth in 1869—to govern their road work. The Gas Company, in view of the aqueduct and the present-day conditions of the roads in regard to tenancy by several public services, did not consider that the proposed clause gave them adequate protection. An interview on the subject was sought by the Company with the Corporation representatives; but this was refused. So it came about that the matter had to be brought before the Duke of Wellington's Committee; and, in the result, what the Gas Company desired was given them in full, save in respect of a suggestion that the underground works to be constructed by the Corporation should have a cover of 3 feet from the surface of the roadways. Upon this point, however, the Company's Engineer (Mr. P. G. Winstanley) did not insist, so long as the Company were adequately protected. The depth was therefore deleted; and the remainder of the protection was granted. The main provisions of the new clause are quoted in our "Parliamentary Intelligence;" and it will be seen that they are quite in accord with modern legislation.

The Even "C.V." Standard.

The calorific value standard of 500 B.Th.U. (total heat basis) is gaining favour in place of the 540 B.Th.U. standard, with a margin of 7½ per cent. It certainly simplifies things. The Ilfracombe Gas Company put it before the Unopposed Bills Committee last week; and they had no objection to the change. There is point in what Mr. Arthur Lees (the Parliamentary Agent for the Bill) told the Committee, that there is the danger of a standard with a margin giving rise to friction with the local authorities. He finds the concrete standard is more popular than the one in the Model Clause, though there is no real difference. The Board of Trade, like the Parliamentary Committee, cannot see any objection to the simplification.

Water Bills.

When the South Staffordshire and the Wolverhampton Corporation Bills came up for the consideration of clauses, two or three important points were raised. In the case of the Corporation Bill, the Committee gave the landowners a clause that enables them to apply for an injunction in the event of the Corporation exceeding their pumping powers from the well now authorized. These are up to 1½ million gallons a day, taking the average over a monthly period. The new well is to be lined to a depth of 300 feet, or to the bottom of the Keuper sandstone. In connection with the South Staffordshire Company's Bill, several local authorities urged that the Company should have imposed upon them the obligation of maintaining an equal pressure of water in their mains. But this was rejected by the Committee; but the opinion was expressed that the Company should show a little more activity in meeting the requirements of the local authorities. From what we know of the Company and its management, nothing within reason is left undone in the effort to secure good service.

Heat in a Gas-Engine Cylinder.—At the meeting of the Institution of Mechanical Engineers next Friday, a paper on "The Distribution of Heat in the Cylinder of a Gas-Engine" will be submitted by Professor A. H. Gibson, D.Sc., of University College, Dundee, and Mr. W. J. Walker, B.Sc. (Carnegie Research Scholar), of Dundee. The meeting will be at the Institution of Civil Engineers, Great George Street, Westminster.

The London and Southern District Junior Association will hold their annual general business meeting, on Friday, at the Westminster Technical Institute, S.W., when the report and balance-sheet will be submitted and new office bearers elected. There will also be a report by the President (Mr. J. Hewett) on the work of the Association during the past twelve months. It has been decided, in view of prevailing circumstances, not to have a summer meeting this year.

Petroleum and Natural Gas in Ontario.—The Imperial Trade Correspondent at Toronto (Mr. F. W. Field) reports that the production of crude petroleum in Ontario in 1914 amounted to 7,437,356 gallons, as compared with 7,915,795 gallons in 1913. According to the official report for 1914 of the supervisor of crude petroleum bounty claims, says the "Board of Trade Journal," the oil market throughout Ontario did not show much activity during the year, and no new fields were opened up. This is accounted for particularly by the large storage of oil in the United States, which has resulted in the lowering of the price of crude oil in Canada, and a consequent tendency to discourage the prospecting of new fields. With a rise in the price of crude oil, new life will be resumed in the oil districts, and good results may be expected. The gas-field at Oil Springs, however, has been a boon to the northern part of Enniskillen. The pressure in some of the wells has been enormous, and has exceeded all expectations. The gas is of excellent quality, free from odour; and the whole population of the county of Lambton is being supplied with it for fuel and light.

NATIONAL CONFERENCE ON COAL SUPPLIES.

A Representative Gathering in London of the Gas and Electricity Industries.

That widespread anxiety in the existing coal position is felt by the interests concerned, was clearly manifested last Thursday afternoon at the hour fixed for the opening of the national conference of the gas and electrical industries on coal supplies. When the chair was taken by Sir CORBET WOODALL, D.Sc., the splendid hall of the Institution of Electrical Engineers, on the Victoria Embankment (which had been lent for the purpose), was filled with a representative gathering of delegates connected with one or other of the industries named. At the immediate right hand of the Chairman was Sir John Snell (the President of the Institution of Electrical Engineers), and on his left Mr. John Bond, of Southport (the President of the Institution of Gas Engineers). In the circular-letter calling the conference, it was pointed out that various steps have been taken to deal with the serious state of affairs which has arisen in consequence of depleted stocks of coal, the difficulties of obtaining supplies by land and sea, and the abnormal increase in freights and coal prices for present and future requirements. The joint conference was therefore decided upon, for the purpose of considering the best course to adopt for bringing the far-reaching issues involved under the attention of the Government, with a view to some immediate measures of relief being obtained. The conference lasted close upon two hours; and the series of resolutions submitted were passed with gratifying unanimity.

On rising to open the proceedings in the Lecture Hall of the Institution of Electrical Engineers, Victoria Embankment, Sir CORBET WOODALL, D.Sc., had a very cordial reception from the large assembly. He at once proceeded to introduce the business of the meeting with the following remarks.

The CHAIRMAN said that at the outset he would like to express the satisfaction that he felt in attending a meeting for a common purpose of the combined industries of gas and electricity. It marked, he hoped, a new departure with regard to the relations of these two great industries. He had no doubt that before they parted opportunity would have been taken to express to the Council of the Institution of Electrical Engineers the gratitude of those who were not electricians for their hospitality in granting the use of their beautiful hall.

A SITUATION WITHOUT PRECEDENT.

The situation which faced them to-day, and which they, as representatives of the united industries of gas and electricity supply, were called upon to consider, was one without precedent, and of grave importance to the welfare—he thought he might say to the safety—of our country. Coal was absolutely essential to the manufacture of gas, and hardly less so to the production of electricity. The short and cold days of winter made a much larger demand than those of summer, upon which they were just entering. Large stores should now be accumulating, to again meet this heavy and inevitable call. Instead of this, they had found it difficult, and in certain cases impossible, for some time past to procure what had been necessary from day to day. Their reserves had been steadily vanishing, and they were face to face with the prospect of an adequate continuance of the supply becoming impossible. He was told the other day by an official in a responsible position in a Government Department that he overrated the importance of such a catastrophe. The official said he was prepared to carry on his work by candle-light, and was not alarmed at the prospect of darkness throughout London—the one aim he had before him was to bring the war to a successful end. Now, with the latter purpose they were all at one. ["Hear, hear."] To its achievement those present were prepared ungrudgingly to contribute, according to their means, all that was needed—whether of time, or effort, or money. But having a great purpose in view, it was surely well to consider with care the means by which it was to be accomplished. This the man of one idea sometimes failed to do. With a yet distant haven to reach, it was supreme folly to scuttle the ship by which alone the journey could be made. He spoke thus because on more than one occasion they had been met with the suggestion that their petitions and remonstrances were lacking in patriotism—that their attitude was that of greedy traders seeking simply the maintenance of profits, and to this end asking for some preferential treatment. They indignantly repudiated such imputations.

THE FACTS OF THE CASE.

What were the facts? They represented institutions which had accepted from Parliament duties of a public character and of great importance. Obligation was imposed upon them to fulfil these duties, and in return certain exclusive privileges were granted to them, which were hedged round by restrictions and limitations in the public interest. If they failed to perform the duties imposed upon them, no one else, except after long delay, could take them up; and the whole community must suffer. These duties included, not simply the lighting of the public ways, but also the lighting and warming of the houses of all, rich and poor, the public buildings, including at the present time barracks, hospitals and camps, factories for the manufacture of great guns and rifles, clothing for soldiers and sailors, and all the mainfold munitions of war. But, further, gas and electricity were used in a vast number of industries, not for lighting only, but for heat and power; and the failure of the supply would involve a reconstruction of users' plant which would be impossible, even at great cost, without long notice, and a deplorable reduction of output. From now to the end of September fully 75 per cent. of the gas sent out in London would be used for fuel purposes, for which coal would have to be used if gas were not. The cooking of probably one-half of London's food—and the same might be said of a vast number of other towns—from the palaces, the great hotels and clubs, warehouses and shops, to the workers' cottages, was done by gas. Of the last-named, there were in and around London about one million families taking in pennyworths the supply needed for their light and for the cooking of their food. It was interesting to know that for the manufacture of the gas used by only five of the leading caterers of London the carbonization of 40,000 tons of coal per annum was necessary. Again, many important industries were dependent on the secondary products of coal distillation; and at the present time gas companies had so adapted their plant that they were producing materials of vital importance to the Government in carrying on the war. One gas company in London was producing the equivalent of about 7000 tons annually of high explosives. He might mention that this aspect of the question was so far recognized in Germany, that definite instructions had been issued throughout the country to encourage the use of gas and coke, so that as much coal as possible might be carbonized in closed vessels, in order to recover the products which were now found to be of such urgent and vital importance. The statement he had made was of facts familiar to most present, but necessary to be emphasized at the present time, when persons who should know better spoke lightly of the discontinuance of the industry's work.

CAUSES OF THE TROUBLE.

A word as to the immediate causes of the trouble. Until recently there was available sufficient coal at the pits; but the difficulty lay in the carrying of it. The Admiralty, needing a vast fleet of steamers as tenders to the warships and as transports for troops and stores, commandeered what vessels they thought suitable—largely from the coast services—leaving a number insufficient for the ordinary service. For those that were left available, the owners were able to demand very high rates, with the result that the freight from the Tyne to the Thames rose from 3s. per ton before the outbreak of war to four times the amount. Similar causes—the greatly increased needs of the war services—led to a congestion of traffic on the railways; and though the rates were not increased, the delays of goods, especially minerals, became very embarrassing. To meet the situation at sea, the Government allowed certain enemy ships interned in our ports to be brought into use especially for the service of the public utility undertakings. Freights continued to be high, partly because the Government, who might, they thought, have been content with a charge sufficient to pay a reasonable return—such as that they were paying for the ships they had commandeered—elected to demand the extravagant rates required by private owners. Now the position had been altered. The supply of coal had fallen below the demand. The charges for what was obtainable had been put up heavily; while at the same time—and because of the shortage of coal—there was a plethora of ships, and rates of freights had fallen. The present difficulty was the greater. It was no longer a question of money; they were faced by a coal famine. Unlike, however, the famines which were due to natural causes, it was preventable—being due to causes which could, and surely ought to, be dealt with. ["Hear, hear."]

THE REMEDIES AVAILABLE.

The reduction of output was doubtless due largely to the withdrawal of the great number of miners who had gone to swell the noble army who were fighting, or preparing to fight, the country's enemies. All honour, both to them and to those others who might yet follow in their steps, but not less, also, to those who were with equal devotion carrying the burden of keeping up the output and supplies so far as their power allowed. If, when the men at the front made the great election—offering, if necessary, to surrender their lives to the Cause—their mates at home had

decided, by greater effort, working longer hours, to fill up the gap, there would probably have been no deficiency. But they had not done so. Wages had been raised materially; and as the average miner was not given to saving, he took a longer time off work to spend his money. The owners were partly responsible for this. They were demanding the uttermost amount which the needs of the country and its industries rendered obtainable. The men knew the profit which attached to these high prices, and would be more than human if they did not demand a share. ["Hear, hear."] People were becoming used to a considerable interference with the liberty of the subject to do as he pleased. Might they not hope that some limitation might be put upon the profits of collieries and royalty owners? The workman question was more difficult; but by payment of wages on a scale governed by the weekly individual output, by compulsory saving of part of the miners' earnings, or in some other way—best of all by effective appeals to their patriotism, their care for their friends at the front, and of the helpless ones at home, improvement could surely be made. There was still another way by which the end sought could be attained. This was, by preventing the export of coal so long as Britain needed it. He presumed that such a rule already applied to the steam coal necessary for the Navy. Let it be extended to other public services. Again he said this question was one vital to the nation, and that extreme measures were necessary and inevitable. The Government had recognized how urgent was the case, and had appointed a Committee, having for its Chairman a gentleman of wide experience and conspicuous ability; and one way in which they could probably press their case effectively would be by seeking an interview with this Committee. This conference might appear to be a severely commercial gathering for commercial ends; but it was far more than this. They knew how terribly injurious would be the catastrophe they dreaded; and they were using, and would use, what power they had to prevent it. By maintaining their industries going, they were keeping employed men who would otherwise suffer want. They were earning money to help furnish the Chancellor with the vast sums he told them, and they knew, were necessary to carry on successfully the terrible war. They would be little use, most of them, in the fighting line; but in the ways open to them they desired to serve their King and Country with the utmost of the power left to them, and they had a right to demand that their hands should not be tied.

Electrical Co-Operation.

Sir John Snell (President of the Institution of Electrical Engineers) said he wished, in the first place, on behalf of his Institution, to offer to the gas delegates present a most hearty welcome, and to emphasize how glad the Council and the Institution were that their hospitality had been accepted for this important gathering. It was not always that the two industries were so happily able to co-operate. His Council desired him to say they were wishful to do all that was possible to assist in this urgent matter—providing that it did not embarrass the Government and the authorities in the proper conduct of the war, which, of course, must come first and foremost in the minds of all of them. Coal was necessary to the gas and electrical industries, for reasons both of public health and public safety. Not only so, but there were many industries which at the moment were perhaps turning out nothing but munitions of war, who were dependent entirely upon the public electricity supply or upon gas-driven plant to enable them to continue their output. Therefore, anything which would tend to shut-down or embarrass the public supply given by the electrical or gas undertakings would be distinctly injurious to the national interest. What, he took it, they wanted to do was to endeavour to improve the output from the pits. As he understood it, some of the pits were now working four days a week. They also wanted to improve the transport facilities from the pits to the undertakings. Though he was told that the difficulties which existed at the beginning of the war in the matter of the dearth of waggons had to some extent been mitigated, yet if the Government could give greater facilities for sea transport it was possible that the present congestion upon the railways would be still further relieved, and, therefore, the undertakings still further benefited. No doubt there would be many other speakers; and, after the Chairman's very full address, he did not know that he could usefully detain the meeting by saying anything further.

Facts from Manchester.

Alderman William Kay, J.P. (Chairman of the Manchester Corporation Gas Committee), said he thought that the resolution which had been handed to him to propose would, after the remarks of the Chairman and Sir John Snell, meet with their approval. Before reading the resolution, however, he would like to say very shortly how much he appreciated this effort to further the earlier efforts of the gas and electrical industries to impress upon the Government the necessity for doing something, and doing that something quickly, to help the position. In his opinion, time was of more value than money at the present moment, because one could not control a large undertaking, either gas or electricity, without viewing with very great alarm the position of the coal stock to-day when compared with what it was in normal periods. It was a fact that in the undertaking with which he was more particularly familiar they were to-day worse off for coal than after the coal strike—a position for which there was, to his mind, no justification. Their stock at March 31 stood 70,000 tons below normal. By rights they should be adding to their stocks now, instead of depleting them. The Chairman had pointed out the seriousness of the position from a gas point of view; and it was indeed serious. Gas undertakings were loyally doing all they could to help forward the Government with the supply of commodities which were of great moment at the present time. It was unfortunate, in his opinion, that they were so late in the field in this direction; but that was the position, and they should do all they could to keep their supplies going. To this end, he proposed the following resolution:—

> In view of the vital necessity of gas and electricity for lighting, cooking, the production of explosives and other munitions of war, and for manufacturing purposes generally, it is resolved—
>
> That this meeting congratulates the Government on having appointed a Committee to deal with the exportation of coal, and hopes that this may be effective in limiting exports, but views with the deepest concern the depleted stocks of coal, and the difficulty, under present conditions, of renewing them for present and future requirements, and urges the Government to take further and immediate steps—
>
> (*a*) To increase the output of coal from the pits.
> (*b*) To give greater facilities for the transport of coal by rail, and
> (*c*) To have regard, in requisitioning steam colliers, to the requirements of the public utility undertakings which depend for their supplies on sea-borne coal.

This resolution, he felt sure, required little further commendation. It was apparent to all of them that the Government should move at once in this direction. Unless immediate progress was made, they could not hope to meet the winter demands with anything approaching safety. It would be absolutely impossible; and the gas and electrical undertakings must be kept going at any cost. He could not find words sufficiently to condemn the attitude of the man content with a candle. As far as gas companies were concerned, they were tied down hand and foot in many ways; and he did not think that their worst critic could say that this was a question of pounds, shillings, and pence with them. He knew it was not so in his own case, and was confident the same remark applied to them all. They had the interests of the country first and foremost in their minds. As he had already remarked, time was of the greatest moment, and was really more valuable to-day than money in the case of their particular undertakings. He trusted all present would appreciate the seriousness of the position, and give the resolution their heartiest support.

Mr. Frank Bailey (Joint Managing-Director of the City of London Electric Supply Company), in seconding the resolution, remarked that they all remembered that some time ago Parliament approved of the appointment of a Committee to investigate the problem of the supply of house coal in London. The report of the Committee had been published; but he was not aware that any steps had been taken to give effect to it. The Committee referred to next winter's requirements, and drew attention to the urgent necessity of providing coal-stores. The report was apparently sound, and the recommendation generally seemed to be wise; but the Committee were wrong in one matter—the location of the store. The undertakings those present represented should be the coal-store, from which was supplied light, heat, and power. Every man did not want a coal-store, and ought not to have it. This was the only oversight in the report of the Committee. It seemed to him the time had come when it was necessary to draw attention to the fact that their industries had been at work for many years, and had not received the public recognition which their duties deserved. Surely the Government should see that they had a supply of coal. Of course, so far as gas companies were concerned, admirable as their methods were, they were dependent more or less on particular classes of coal; whereas the electricity undertakings could go to any field. In this way, the latter had a wide range of selection, and they might hope that their demands would be not very difficult to meet. With the assistance of the Chairman, and the influence he could bring to bear, they had every hope the Government would recognize the necessity of the work the industries were undertaking. He admired the modest way in which the Chairman had put forward the claims of the gas industry, which had nobly come to the front, and to assist the War Office had laid down special plant for the recovery of toluol, and had so given them an important article to help defeat the enemy. The gas undertakings had some advantage there. Unfortunately, the electrical industry could not wash their Board of Trade unit, and so could not compete with reference to the valuable bye-products of gas undertakings. No doubt the Government had done their best to meet a difficult state of things; and he thought they ought to acknowledge with their deepest thanks the straightforward and generous conduct of the trade generally so far as supplying coal was concerned. He believed that in many cases merchants, coal contractors, and others engaged in supplying them with the requisite fuel had actually sustained a loss. It was only fair that he should put it in this way, because, in seconding the resolution, he felt they must go to the Government with perfectly clean hands. They had no one to blame. They simply went to the Government and asked them to put their demands first, on the ground that they must be regarded as the coal-cellars of this country.

An Acknowledgment of Work Done.

Mr. John Bond (President of the Institution of Gas Engineers) said he was sure they had all listened with the greatest of interest to the various speakers who had brought forward the question of the shortage of coal supplies. The Council of the Institution of

Gas Engineers had now had this question under consideration for some time, and had approached on many occasions the various departments of the Government; and he was pleased to learn that the Board of Trade were now taking steps to restrict the export of coal. He believed that this great movement had been brought about chiefly through the energies of the Manchester District Institution of Gas Engineers; and an important part had been taken by Alderman Kay and Alderman Phillips. He felt that it was of the utmost importance that the Government should secure for both the gas and electrical industries a proper amount of coal, because the nation largely depended upon these two industries for their munitions of war—and especially on the products which went to make the high explosives, chiefly toluol. He sincerely hoped that the Government would take immediate steps to see that these two industries got their proper supplies. It was a great pleasure to him to support the resolution.

The Chairman said he had hoped that Mr. Charles Carpenter would say something on this resolution; but unfortunately, though he was present, he had so severe a cold that he had asked to be excused from speaking.

The Cost to Electrical Undertakings.

Mr. R. A. Chattock (the Birmingham City Electrical Engineer) said that, in the absence of Mr. H. Richardson, the President, he had been asked to represent the Incorporated Municipal Electrical Association. The coal consumed by these undertakings last year was upwards of 2,000,000 tons; and it was a fact that most of the undertakings were now running with very small margins of stock. The stocks had been reduced to something like 25 per cent. of what they were at the beginning of the war. This figure, of course, was an average. The Government had already been helping certain of the larger undertakings to obtain coal; and at the present moment the stocks of these undertakings were being increased again, but only to a very slight extent. It showed, however, that the Government were recognizing the difficulty; and he thought it strengthened their hands in going to them and asking them to help the undertakings all over the country. It had been mentioned that these concerns were supplying light to the public; but he supposed that the light which was being supplied to private users only represented a tithe of the power and light that was being furnished to the factories. It was the latter supply they had to safeguard and maintain at all costs, because at the present moment the power supply was being used almost exclusively for the production of war material. In saying that the Government had helped certain undertakings to obtain more coal and get their stocks up again, he wished to emphasize that this had only been arranged at a very much increased cost. The average was about 50 per cent. on what was being paid before the war. This was an enormous increase. In going to the Government, they ought to emphasize this point, and ask them to assist in getting coal at a reasonable price. ["Hear, hear."] They should not be forced to pay this enormous increase for the coal they were bound to get whatever the cost. First of all, adequate supplies should be ensured to all the undertakings; and, secondly, these should be supplied at a reasonable price.

The Need for Concrete Suggestions.

Mr. R. J. Neville Neville, M.P. (Chairman of the Brentford Gas Company), remarked that the question now being discussed had been before the House of Commons on several occasions, and with no very great success to the industries. He thought they would have to tell the public generally that, unless coal could be procured on more reasonable terms than in the past, they would have to be more careful about wasting their gas, and would have to go to bed earlier, and not rely as hitherto upon a uniform supply of gas to the private consumer. They could not "make bricks without straw;" and if they could not get coals, there would have to be economy in the consumption of gas. He would like to know whether any concrete suggestion had been put forward for getting over the difficulty that had been met with—whether there was any suggestion that could be made to the Government which the Government would say was a good one. His own experience was that, unless one went to the Government with something concrete in his hand, it was difficult to make much progress. He would therefore like to suggest that this great assembly of persons interested in the coal question should apply themselves particularly to finding out some concrete way in which they could get over the trouble that faced them. There was great difficulty about the interned vessels; and there was no chance, so far as one could see, of getting more ships. He did not know whether there was any possibility of the gas and electrical industries combining, and getting a colliery which they could work themselves. It was risky; but in time of war they had to take risks. He would suggest that, when approaching the Board of Trade, they should point out that their statutory duties compelled them to do many things which in time of peace were perfectly right, but in time of war were extremely onerous and difficult to carry out, and that the authorities ought not to be too careful in noting what was done amiss with regard to points of purification, pressure, and other similar matters. They should ask for this relief from carping criticism by those who did not know what great difficulties the undertakings were placed in. The only thing the undertakings themselves could do seemed to be to try and economize, and ask consumers to do the same.

Some Further Views.

Bailie T. J. Irwin (Chairman of the Glasgow Corporation Gas Committee) said he thought the resolution embodied what was in the minds of those present. His Corporation were faced with a probable increase, under the conditions now ruling, of something like 9s. per ton. They were not prepared to recommend to their consumers that they should economize to the extent of reducing this; but they were prepared to make every effort towards bringing pressure to bear upon those who were responsible for the maintenance of the present position. Great benefit could be anticipated from the proposals of the Board of Trade with regard to the export of coal. With regard to coal reserves, he gathered they were not increasing very rapidly. Awhile back, however, the total reserves at Glasgow were something like 27,000 tons, against a normal reserve of 100,000 tons. To-day the stock stood at just a little under 30,000 tons; so they were not so badly off so far as quantity was concerned. But they were being crucified on the price. [Laughter.] They were not in the happy position of being able to make profits to reduce the rates. All the surplus revenue must go to reducing the cost of the commodity.

Sir A. B. Kennedy remarked that he was entirely in sympathy with the first resolution—more so than with the second, because he felt that they had to get the coal first. He hoped if they adopted Mr. Neville's suggestion and put definite suggestions before the authorities, they might get something done to increase the output. This was what they wanted. He could endorse Mr. Bailey's statement by saying that in London, so far as the interests he was connected with were concerned, the behaviour of the firms supplying them with coal left absolutely nothing to be desired. He was certain they were not making any extra profit, and was strongly of opinion that some of the figures had been the other way. He thought there was no blame to be put on these firms; and he hoped this was the general experience.

Mr. H. E. Jones (Chairman of the Gas Companies' Protection Association) said there could not be a shadow of a doubt that the Government could, and he thought would, find means for preventing competition for our coal from abroad. Charity should begin at home, and they had nothing to give away. ["Hear, hear."] As Mr. Carpenter had pointed out in a circular, the Prime Minister had remarked that coal might be considered the life-blood of this country; and if they were to spend their life-blood, it should be on the protection of their own homes, and not those of foreign people. Of course, they would help their allies and neutrals; but they ought not to feed their enemies, which he thought was what was going on now. The resolution was one about which there should be no argument. They were going to provide the motive power behind this new Committee; and he would give them a key to it. This was in reality a consumers' question, both as regarded gas and electricity; and if the Government could be made to see that the voters were objecting to being pinched, they would quickly do something.

A National Question.

Sir Daniel F. Goddard, M.P. (Chairman of the Ipswich Gas Company), heartily supported the resolution, and expressed the opinion that they had an exceedingly good case to take to the Government. Mr. Neville had suggested that they ought to have a very definite idea of what they were going to do. In the resolution, he thought the idea was the restriction of the exportation of coal; and he gathered from conversations he had had with men in the coal industry in these very anxious times, when they were all trying to procure the coal they needed, that there was nothing which would add more largely to the supply than some restriction on the exports. Therefore this was a definite proposal. There was another point to be considered. This was not merely a local question which applied to one district or town. It affected the nation; and this gave them an admirable case for going to the Government and asking their assistance. He did not think the Government realized the enormous bearing of this question upon the workers of the country. They had not realized that the commodities which were sold—gas and electricity—were not merely things that were used by the wealthy or well-to-do, but were becoming a vital necessity to the workers of the country. Then there was another thing, and that was the important bearing of supplies of gas and electricity upon the industries of the country. They ought to make a very strong point of this. The number of manufacturers dependent upon gas and electrical power for their work would be startling if put into concrete figures that could be laid before the Government. A further point was that the undertakings that were represented at the conference were not animated by the desire of making large profits; and this was really a point of very great weight indeed. Everybody connected with these industries well knew that their profits were limited very carefully by the State. The main thing was they must have coal to carry on their work. This was the first point they should bring their attention to bear upon. The next point was a reasonable price, which would prevent them having to lay an unnecessary burden upon the workers and the poor of the country.

The Work of the Miners.

Bailie Lindsay (Convener of the Works Committee of the Edinburgh and Leith Gas Commissioners) said it was coal they wanted. The figures of the Board of Trade for 1912 showed that the total export of coal from this country was some 67,000,000 tons per annum; and if export was totally prohibited to others than our allies, this would not provide a sufficient source of coal. It did seem strange to him that they had not yet gone to the very kernal of the question—the increased working of the men at the pits. The Government had done much to increase the output of munitions of war, &c., and why was it they had not acted upon

clause 4 of the Coal Mines Regulation Act, 1908, which was in these terms:

> His Majesty may, in the event of war or of imminent national danger or great emergency, or in the event of any grave economic disturbance due to the demand for coal exceeding the supply available at the time, by Order in Council suspend the operation of this Act to such extent and for such period as may be named in the Order, either as respects all coal mines or any class of coal mines.

This clause might have been written yesterday or to-day. It could not have been better framed to meet the circumstances. The men who were most physically fit had gone away to fight for the country; and the output of coal had been largely affected—he believed to the extent of 30 per cent. It did therefore seem to him that the Eight-Hours Act should be suspended. If the men could work eight hours at the face of the coal, instead of eight hours from bank to bank, that would be something.

A SPEAKER remarked that the statement that the output of coal had decreased 30 per cent. did not apply generally. Although large numbers of miners had gone to the front, pits that were working four-and-a-half to five days a week last year were working six days now, which more than counterbalanced the falling off of others.

The CHAIRMAN: I believe there is no question whatever that the gross output of coal has been greatly reduced—42 per cent., I have been told.

Mr. F. W. Dow suggested the addition of the words—

> That the Government be asked to consider the advisability of taking over suitable mines for the production of the coal used by the industries represented here to-day.

The CHAIRMAN said he would accept this as an amendment; and it was formally seconded.

On the resolution being put to the meeting, however, it was carried unanimously.

ON THE POINT OF PRICE.

Alderman F. S. PHILLIPS, J.P. (Chairman of the Salford Corporation Gas Committee), said he was very glad to be present at so magnificent a meeting, which showed that there was some life in the gas and electrical undertakings, and that they meant, as far as they could, to look after the interests which were committed to their care on behalf of the people of this country. He fully agreed with every word of the resolution that had just been passed. But it did not go quite so far as he would like to see them go that day. It left out a very important matter—not the principal thing, but a very important secondary matter. That was, the question of price; and he proposed to move a resolution in these words—

> That the Government be asked to take such steps as may be necessary to reduce the price of coals to reasonable limits.

This did not commit anybody. There might be a little difference of opinion; but still they could not afford to give the question of price an absolute go-by—especially when they had had a Departmental Committee of the Board of Trade reporting—

> We have pointed out that prices have risen owing to the temporary lack of equilibrium between supply and demand; and that they have risen without relation to the cost of production.

Then, again, in summing up their recommendations, the Committee said—

> If prices do not shortly return to a reasonable level, the Government should consider a scheme for assuming control of the output of collieries during the continuance of the war.

Did not this imply that, in the opinion of an impartial Committee, asked by the Government to report without fear or favour, prices were not at a reasonable level now? Of course, it did. They must have coal at any price, rather than go without; but they would have it at a reasonable price, if they could get it. His resolution left the Government to say what steps were necessary to reduce the price. All they asked was that the price of coal should be a reasonable one—whatever that might be. When one remembered that something like 20,000,000 tons of coal a year were consumed by the gas and electrical undertakings of this country, it was evident that every 1s. increase in price meant close upon £1,000,000 which had to be found; and when they heard of advances of anything between 9s. and 5s. per ton, and translated these into millions of pounds, it became clear that somebody was being taxed to a very large extent. They wanted this amount to be kept within reasonable limits. They might have the very best Government in the world, but, like a machine, unless there was some impelling force behind it, it would not move. They were there to act as a sort of steam-boiler, to put pressure into the machine, and make it move.

Alderman F. HALL, J.P. (Chairman of the Workington Corporation Gas Committee), in seconding, remarked that the question of price was a very serious one indeed. If it were a fact, as was maintained, that coal prices were fixed by competition in the various districts of the coalowners, possibly they would not have to complain. Now, he happened to live in a district in which every pound of coal was governed by the Cumberland Coal Association, and he had with him some recent letters between one of the collieries in the district and himself. Early in April he saw a representative of the colliery, and arranged with him for the delivery of a certain quantity of coal for the Gas Department up to June next, at a very greatly enhanced price over what they had been paying. The representative stated a figure in a letter, and added "or at other such less price as may be sanctioned by the Coal Association." His colliery were willing to accept a price of 2s. 3d. per ton less; but later the representative wrote again saying they had not been able to obtain any reduction of the price fixed by the Coal Association. There was no Free Trade between the coal-owner and the coal user. It was perfectly right to urge the desirability of strong inquiry being made by the Government into the fixing of prices for coal for gas and electricity undertakings. In his area they could give them such information as would lead to the opening of their eyes.

Alderman WHEATLEY (Huddersfield) said it seemed strange for everybody to be asking for a necessity to be made cheaper. If the Government knew its duty, it would be aware that it should have command of the coal, as it had of ammunition; and it would make the coal get-able for the welfare of the people of the country at a rational and reasonable price. He hoped this phase of the question would be strongly emphasized. Was not coal one of the most precious things they had? It was a pity they should have to propose such a resolution at this time of day; but the Government should be compelled to do something in this particular matter for the gas and electricity undertakings.

Bailie W. B. SMITH (Convener of the Glasgow Corporation Electricity Committee) remarked that if the Government would stop the export of coal to Amsterdam, Rotterdam, Norway, and Sweden, the price of coal on the Glasgow Exchange would come down immediately. The price might be brought down in this way while the Government were considering further means of reduction. He believed there was in Sweden at least one factory making shells for the Germans; and perhaps this went some way to explain why they wanted more coal than ever before from this country.

Sir JOSEPH A. BELLAMY (Chairman of the Plymouth and Stonehouse Gas Company) said they were going to the Government to ask for something; and the matter should be well thought out, so that a remedy might be indicated. It was all very well to ask for a reasonable price; but districts varied very much in many respects. They wanted an inquiry as to the charges that the collieries could legitimately put upon their industries. He would rather they did not emphasize particular countries which they thought should be deprived of coal. The existing regulations with regard to miners should be amended so as to allow of the men working longer than they did at present. With reference to ships, if this question were handled in a proper way they ought to get some relief from a different method being adopted with interned ships and those owned by firms who had contracted to supply coals for a definite time to different undertakings. It seemed a monstrous proposition that, if a gas company had a contract with a shipowner for twelve months, the Government should take a considerable proportion of the tonnage, and possibly pay 50 per cent. more to the owner than the contract price. In this way the shipowner obtained extra profit; but the gas company were left with no compensation, and this matter of compensation should be in some way adjusted. Surely the gas undertakings were making a big loss by being deprived of the ships they had hired. It was a point on which they were entitled to some relief; and this would tend to bring prices down.

Mr. JOHN CHRISTIE (Electrical Engineer to the Brighton Corporation) said that, as a proof of what happened to an undertaking depending for its supply upon sea-borne coal, he might mention that his Corporation paid about £15,000 a year at the present time for the partial services of a coaster which was not worth more than £5000. The profits that owners of these boats were now making must be colossal; and the attention of the Chancellor of the Exchequer should be drawn to making a surcharge on such owners, whereby their profits should be limited to about 15 per cent. He honestly believed that agents supplying coal had helped the undertakings in every way possible. He knew in his own case that they had borne part of the cost that was incurred.

A DELEGATE moved as an amendment—

> That the Government be asked to endeavour to secure that, on the renewal of contracts, the price should only be advanced by the increased cost owing to the war.

He remarked that what affected one district did not equally affect another. It was not unreasonable to ask colliery owners to be satisfied with previous profits. On the renewal of contracts the only thing to be taken into account was the increased cost of production. The coalowners were not entitled to extract extra profit because foreign countries were asking them to supply coal. Exports should be forbidden until the Government had ascertained the amount required in this country over the next twelve months, and this quantity had been secured.

The CHAIRMAN said this was a suggestion upon the resolution, but hardly an amendment. There was no one who did not wish to see the price of coal brought to a reasonable figure. The difficulty was to say what was a reasonable price in this, that, or the other district.

The resolution was then carried by an overwhelming majority.

THE DEPUTATION.

The CHAIRMAN then moved

> That a representative deputation of the gas and electricity industries be now appointed to present our case to the Members of Parliament, and to take such further action as may be found advisable.
>
> That a conference with Members of Parliament be held in London, on to seek their aid in urging upon the Government immediate action to give effect to the above recommendations.

That each authority represented pledges itself to take steps to secure the presence of their Member or Members of Parliament at the proposed conference.

He said he did not propose to add anything by way of commendation, except to remark that he thought their friend Mr. Neville had hardly read the first resolution with sufficient attention, or he would not have been under the impression that there were no definite proposals to lay before the Government. The limitation of exports was above all things the way in which they thought the Government could help; and their careful attention would be asked to this.

Mr. D. MILNE WATSON then read the names of the proposed deputation, as follows:

Sir Ryland Adkins, M.P., Director, Herne Bay Gas Company.
Mr. Edward Allen, Engineer, Liverpool Gas Company.
Mr. F. Bailey, Joint Managing Director, City of London Electric Light Company.
Mr. J. Ferguson Bell, Engineer, Derby Gas Company.
Sir Joseph Bellamy, Chairman, Plymouth Gas Company.
Mr. John Bond, President, Institution of Gas Engineers.
Mr. W. G. Bradshaw, Chairman, Commercial Gas Company.
Mr. Charles Carpenter, Chairman, South Metropolitan Gas Company.
Mr. W. A. Chamen, Manager, South Wales Electric Power Company.
Mr. R. A. Chattock, Acting President, Municipal Electrical Association.
Mr. F. E. Cooper, Secretary, Gas Companies' Protection Association.
Mr. A. C. Cramb, President-elect, Municipal Electrical Association.
Mr. W. T. Dunn, Secretary, Institution of Gas Engineers.
Mr. Hardman A. Earle, Yorkshire Electric Power Company.
Sir J. Fortescue Flannery, Bart., M.P., Director, South Suburban Gas Company.
Sir D. Ford Goddard, M.P., Chairman, Ipswich Gas Company.
Mr. J. S. Highfield, Engineer, Metropolitan Electric Company.
Captain R. S. Hilton, Secretary and Manager, Birmingham Corporation Gas Department.
Bailie Irwin, Chairman, Glasgow Corporation Gas Committee.
Mr. J. R. H Jacobs, Secretary, Southampton Gas Company.
Mr. H. E. Jones, Chairman, Wandsworth, Wimbledon, and Epsom Gas Company.
Alderman Kay, Chairman, Manchester Corporation Gas Committee.
Sir Alexander Kennedy, F.R.S., Consulting Engineer, Westminster Electric Corporation.
Mr. W. W. Lackie, Chief Electrical Engineer, Glasgow Corporation.
Mr. A. Masterton, Engineer and Manager, Edinburgh and Leith Corporations' Gas Department.
Mr. C. H. Merz, Newcastle-upon-Tyne Electric Supply Company.
Mr. Reginald Neville, M.P., Chairman, Brentford Gas Company.
Mr. G. W. Partridge, Chief Engineer and Manager, London Electric Supply Corporation.
Mr. S. L. Pearce, Chief Electrical Engineer, Manchester Corporation.
Alderman F. S. Phillips, Chairman, Salford Corporation Gas Department.
Mr. W. E. Price, Manager, Hampton Court Gas Company.
Mr. P. F. Rowell, Secretary, Institution of Electrical Engineers.
Mr. A. H. Seabrook, General Manager, Marylebone Electricity Department.
Mr. James Smith, Engineer, Belfast Corporation Gas Department.
Sir John Snell, President, Institution of Electrical Engineers.
Mr. C. P. Sparks, Engineer-in-Chief, County of London Electric Supply Company.
Sir Albert Stanley, Managing-Director, London Electric Railway Company.
Mr. C. D. Taite, Engineer, Lancashire Electric Power Company.
Mr. Hanbury Thomas, Managing Director, Sheffield Gas Company.
Mr. F. J. Walker, Conference of Chief Officials of London Electric Supply Companies.
Mr. D. Milne Watson, General Manager, Gas Light and Coke Company.
Sir Corbet Woodall, Governor, Gas Light and Coke Company.

The CHAIRMAN said he did not think anyone could complain that the names read were not sufficiently representative of the two great industries. That the number was large, there was no doubt; but the circumstances demanded a big deputation.

The resolution was carried unanimously.

A vote of thanks was thereafter accorded the Institution of Electrical Engineers for the loan of the hall, on the proposition of Sir JOSEPH BELLAMY, who said it marked an important stage in the joining of forces, and expressed the hope that it might prove to be the first of many combined gatherings.

Mr. EDWARD ALLEN (Liverpool) seconded the vote, which was acknowledged by Sir JOHN SNELL.

Sir FORTESCUE FLANNERY, Bart, M.P. (South Suburban Gas Company), in proposing a cordial vote of thanks to Sir Corbet Woodall for presiding, said that without a Chairman capable of representing the enormous interests that were represented there, the meeting could not have had the success it had had, or produce the influence ultimately which he was sure it would.

Mr. H. E. JONES seconded the proposition, which was carried by acclamation.

The CHAIRMAN, in acknowledging the vote, said the meeting had passed off in a very satisfactory manner; and the unanimity shown must surely carry weight. He would remind them that they were all pledged to use their best endeavours to get the parliamentary representatives of their districts to help in this matter, and especially to attend the conference which would be called in the course of a few days.

EBBW VALE BYE-PRODUCT COKING PLANT.

A New Installation.

AN important step in the history of the Ebbw Vale Coal and Iron Company was taken on Monday of last week, when an extensive new bye-product coke-oven plant was opened at Victoria, Ebbw Vale. The Company have previously made coke by the old method; but an installation on the Koppers system, which was described as one of the finest in Europe, has now altered all this. Although the plant which was formally opened does not cover the production of benzol, we are informed that, at the request of the Government, plant will be erected forthwith for the extraction of toluol. There was a large attendance of Directors and visitors at the opening ceremony, which was performed by Colonel Sir Charles Allen (the Chairman); those present including Mr. F. Mills (the Managing-Director), Sir H. Mather Jackson, Mr. M. Falcon (Colliery Manager), Mr. Walter Dixon (Consulting Engineer), Mr. B. Northgraves (the Secretary of the Company), Mr. Guy Barret (the Furnace Manager), Captain Selway Browne, and others. Mr. A. Victor Kochs, as representing Messrs. Koppers, pointed out that everything possible had been done to make the plant complete.

Sir Charles Allen, in moving the electric switch which started the ovens, said the Company had, during their existence, spent large sums in order that the best methods might be used; but the new plant was the greatest thing they had ever undertaken. Had the bye-products discovery been made when coke was first produced, the financial result would have almost equalled the National Debt. The valuable products of sulphate of ammonia, benzol, tar, &c., would be great assets to the Company; but he had to emphasize the fact that it was coal which was the greatest asset of all. He concluded with tributes of thanks to Mr. Mills and Captain Selway Browne, who had so ably carried out Mr. Mills's instructions.

After a vote of thanks to Sir Charles Allen had been passed, the party made a tour of the works.

Recognizing the wastefulness of the old method of coke manufacture, attempts were made some thirty or forty years ago to devise a coke-oven in which coke could be manufactured, and at the same time the valuable bye-products could be recovered. These efforts have been very successful; and there are now in operation in Great Britain about 8000 bye-product coke-ovens. From a ton of coal such as is carbonized in the new coke-ovens of the Ebbw Vale Company, there can be obtained 9000 to 10,000 cubic feet of gas, 5 to 6 gallons of tar, 20 lbs. of sulphate of ammonia, and 15 to 16 cwt. of coke. Of the gas produced, about one-half is required for heating the ovens; but the remainder can be used for various purposes.

To bring the equipment of their works thoroughly up to date the Company recently decided to do away with a considerable number of their old-fashioned ovens, and to replace them by a battery of the most modern bye-product ovens. After investigating carefully the merits of the various systems, the Company decided to instal the Koppers regenerative coke-oven, together with a bye-product plant on Koppers patent direct recovery system; and an order was placed with the Koppers Coke-Oven and Bye-Product Company, of Sheffield, for the erection of a complete coking installation.

The installation comprises a coal-storage bunker of 1000 tons capacity erected at Waunllwyd, a service bunker of 1000 tons capacity situated at Victoria, 100 regenerative ovens, a bye-product plant for recovering tar and ammonia, together with all the necessary machinery and equipment for working the plant. The plant is designed to produce 4400 tons of coke per week; and in order to do this 5650 tons of coal are required. The coal is brought to the bunker at Waunllwyd in trucks, which are emptied by means of a rotary tippler; and from here it is conveyed by an aerial ropeway into the service bunker at the ovens. The coal is previously washed, in order to remove impurities, and is crushed to a fine state of division so as to allow of the production of a good class of furnace-coke. The ovens are heated by the combustion of a portion of the gas evolved from the coal while it is being carbonized in the ovens.

The coal from the service bunker drops through openings in the bottom of the bunker into a charging-car. This car has four compartments, and the whole of the compartments together hold sufficient coal to completely charge one oven—*i.e.*, about 10 tons. The electrically driven car runs along a track on the tops of the ovens to any required point. Each oven has four openings in the roof, which correspond with four openings at the bottom of the hoppers in the charging-car. The car is run into position over the oven which has to be charged; the covers of the charging-holes being previously removed. The coal is then allowed to drop from the charging-car into the oven, and is subsequently levelled. The gas-pipe from the oven is then connected to the gas-main leading to the bye-product plant, and so the coke undergoes carbonization. At the end of from 24 to 30 hours, the whole of the volatile matter in the coal has been expelled, and nothing but coke remains. The connection between the oven and the gas-main is then closed, the oven-doors removed, and the coke discharged by a pusher, and immediately quenched by jets of water. It then slides down an inclined bench into the ropeway buckets, and is taken away to be used at the furnaces.

The gas, tar, &c., pass from the oven into the gas-main at a fairly high temperature. Here they become partially cooled, and

tar begins to settle out. This runs to one end of the gas-main, and from there passes into storage tanks. The gas, after passing through the condensers and exhausters, is then driven through tar-extractors, which take out the remaining traces of tar. Afterwards the gas is led to the sulphate of ammonia plant. The liquor and tar which have previously separated from the gas are run into a large tank. The tar sinks to the bottom, and is run into a storage tank; while the liquor overflows into a second storage tank, from which it is pumped into a still in the sulphate-house for treatment. The ammonia gas is driven off, and joining the main gas stream passes with it into the saturator. The gas leaves the saturator free from tar and ammonia, and ready to be used for heating the ovens and for other purposes. It is led first of all into a holder, and from there a portion of it is conducted back to the ovens and used to keep them at the required heat. The remainder will be conducted to boilers at the generating station.

The whole of the machinery employed for handling the coal, discharging the coke, &c., is operated by electricity. In the bye-product plant a complete duplicate is provided, so that in case of a breakdown to any particular unit the working need not be interrupted.

The Company employ at present some 12,000 to 15,000 men; and the output is stated to be 2,000,000 tons of coal per annum, 300,000 tons of pig iron, 250,000 tons of steel, and about 20,000,000 bricks. Several extensions are now in hand.

A SHOW-ROOM WINDOW ATTRACTION.

However well show-room windows are "dressed," unless changes are fairly frequently made to maintain interest in them, their attractiveness becomes a gradually reducing quantity. It is therefore a good thing to at times introduce novelties in them which need not necessarily have anything to do with gas lighting, cooking, heating, or power; if the subject of the novelty has anything to do with a matter for information respecting which all the world is agog, so much the better.

There is only one subject to-day—the war—and a novelty concerning it has been produced for show-room windows, club rooms, hotels, and all sorts of places at which people assemble. The designer of this ingenious and attractive novelty is Mr. Samuel Cutler, jun., whose mind has evidently been diverted in leisure moments from gas-works plant to battleships and such-like engineering structures; and the Davis Gas-Stove Company, being ever alert to the necessity of attractiveness in show-rooms to which the public are invited, suggested to Mr. Cutler the desirability of making the "Naval Power Indicator" (as the novelty is called) a feature in show-rooms, especially those devoted to gas cooking, heating, and lighting purposes. By the indicator, the naval "situation" or relative strength of the Navies, is shown at a glance by means of panels, in which silhouette cards of the ships of the various nations engaged in the war are shown in all their glory as fighting units, or placed *hors de combat* at the bottom of the panel, which position is equivalent to the ocean bed.

There is no need to describe the indicator here, as full particulars are given regarding it in an advertisement supplement in this issue. The attraction of, and interest in, the indicator are certain; and a crowd in front of a gas show-room window fitted with these panels must feel inclined to cheer after looking at the British panel, and then at the German one, or, for the matter of that, at the panel of any other fighting country. The panels will make people talk; "the gas show-room window is the place to see them" will circulate throughout a district; and to the gas show-room the residents of a district will make a daily trip to see how things are going with our and our Allies' Navies, and those whose "knavish tricks" we daily pray may be defeated. The windows of the Davis Gas-Stove Company's show-rooms in Oxford Street, have been fitted with a set of the panels, and so inspection of them can be made there, as well as at the address of the firm, Messrs. Brown and Cutler, of No. 17, Victoria Street, who are arranging for the delivery of the panels to any gas company requiring them.

Messrs. Brown and Cutler inform us that the indicator has met with great success in colleges and schools, among whom are mentioned some of the Royal Naval Training Schools.

New Verticals at Nottingham.

Although the preliminaries in connection with the contract yet remain to be settled, it is understood that within a few weeks the work of installing new Woodall-Duckham vertical retorts at the Basford works of the Nottingham Corporation will be proceeded with; the preparatory operations in regard to clearing the site having been for some time in progress. It is in conformity with the long-settled policy of the Gas Committee of equipping the city's western carbonizing station with modern appliances that the extension is being undertaken; the scheme representing the possibility of a far greater output than was contemplated at the branch works at Radford, where retorts of the Glover-West type have been installed, but not yet finally taken over by the Corporation. Certain important matters of rearrangement have been rendered necessary upon a site which from the first presented difficulties from the engineering point of view.

GAS AND WOMEN'S WORK.

There was held during the past week, in the Royal Horticultura Hall, Westminster, an exhibition which had been arranged by the "Daily Express," with the idea of showing "what women can do both outside the home and inside the home, either to earn an independence or to increase the family exchequer during the time of economic pressure."

The inclusion of a selection of modern gas apparatus among a display of this character was eminently fitting. Much of women's work to-day is done by means of gas—which may also certainly claim to increase the family exchequer, inasmuch as it is in many ways undoubtedly economical; and have we not from youth upwards been taught that "a penny saved is a penny earned"? Assuredly, "Women and their Work" could not be adequately represented without the aid of gas. Therefore there was to be seen, among divers exhibits, a neat little show of gas appliances arranged by the Gas Light and Coke Company; and many of the fair visitors must have experienced a thrill of pleasure on glancing at an announcement placed over a Wilsons and Mathiesons' "Advance" cooker, which read "This gas-cooker was designed by Miss Helen Edden, M.C.A." But this was not all. The Company were able to point to the fact that, since the outbreak of war, their staff of fully qualified lady advisers [here is an excellent branch of "women's work"], holding diplomas in cookery, have, under the direction of Miss Edden, given practical demonstrations, lectures, and cookery lessons, dealing with the subject of "Economy of Food and Fuel" for the National Food Fund, the College of Ambulance (Marylebone), the "Daily Express" nurses, "V.A.D." nurses, and others. Members of this highly practical staff are also at the disposal of any others desirous of studying food and fuel economy—matters always important, but doubly so at the present time.

TAR DEHYDRATION AND TOLUOL RECOVERY.

Readers of the "Journal" are aware that the question of the dehydration of tar has lately attracted considerable attention, owing to the fact that prepared tar is being generally adopted for road construction, and that the light oils driven off in the process of dehydration contain all the toluol and phenol originally in the tar. These products are now in urgent demand for the manufacture of explosives; and their proportions vary according to the quality of coal carbonized. One ton of average crude gas-works tar yields when dehydrated 160 gallons of prepared tar, 30 gallons of light oils, and 10 gallons of ammoniacal liquor. At the York Gas-Works, plant for the dehydration of tar has been erected by Messrs. Hird, Chambers, and Hammond, of Huddersfield and London, and we are informed that an average sample of 200 c.c. of the resulting light oil, washed with caustic soda, gave 36 c.c., or 18 per cent., of tar acids. On fractionating the washed oil, the following results were obtained:

Up to 100° C., 70 c.c., or 35 per cent., of benzol.
From 100° to 120° C., 21 c.c., or 10·5 per cent., of toluol.
,, 120° to 125° C., 28 c.c., or 14 per cent., of solvent naphtha.
Residue, 81 c.c., or 40·5 per cent., of creosote.

The oil also contained 6 per cent. of very good pyridine. The above-named plant works continuously and at atmospheric pressure. It may be heated either by gas or by coke breeze; the quantities of fuel required per ton of tar distilled being, we understand, with plants actually at work, 67 lbs. of breeze or 450 cubic feet of gas of 500 B.Th.U.

It is claimed for the apparatus under notice that it completely dehydrates water-gas tar without any difficulty. This is an important advantage, as it is generally admitted that the operation referred to is a somewhat difficult one. Another interesting feature in connection with it is that it can be converted into a complete tar-distilling plant merely by the addition of two units. It will then, from crude tar, be capable of producing crude naphtha, light oils, creosote, anthracene oil, and pitch, the quantities of which can be varied to meet desired requirements.

Referring again to prepared tar, readers may be reminded that the Road Board have prepared three specifications for tar to be used for road-making purposes—No. 1 for surface tarring, No. 2 for tar macadam, and No. 3 for pitch grouting. These specifications have been duly noticed in the "Journal."

We learn that Messrs. Hird, Chambers, and Hammond are erecting a large number of plants for the dehydration of tar and the recovery of toluol, and that they have many now at work completely distilling coal tar, with, it is claimed, very satisfactory results.

Those of our readers who may visit the exhibition of the Royal Academy this year will find, in Gallery IV., a portrait of Professor Vernon Boys, F.R.S., one of the Metropolitan Gas Referees, by the Hon. John Collier; and in the Architectural Room a model of the new offices of the Metropolitan Water Board, by the Architect, Mr. H. Austen Hall, F.R.I.B.A., who, it may be remembered, was associated with Mr. S. Warwick as Consulting Architects for the National Gas Exhibition at Shepherd's Bush in 1913.

MEASURING THE EFFICIENCY OF DOMESTIC FIRES, AND ON A SIMPLE COKE-GRATE.

At the Meeting of the Royal Society of Arts last Wednesday, Mr. A. Vernon Harcourt, D.C.L., LL.D., D.Sc., F.R.S., read a paper on the above subject. The chair was occupied by Mr. F. W. Goodenough; and there was a good attendance. The paper was as follows:

Several months ago a friend told me that he had got a box of some stuff which would make one ton of coal go as far as two. Would I come and see it tried? I found that the box was a cardboard one, holding about half a pint of a pink powder. A heaped teaspoonful of the powder was to be stirred up in a pint of water, and three scuttles full of coal sprinkled with the mixture. The disproportion between the size and number of the lumps of coal and the teaspoonful of powder which was to be distributed over their surface was so great that it was difficult for anyone whose business has been experimental chemistry to go through this sprinkling seriously. However, it was done, and has been done for me many times since. But neither then nor in subsequent trials, using a grate well adapted for such observations, could any material difference be found in the rate of burning with and without the powder. What difference there is seems to be due to the water, which is used as a means of distributing the powder. If coke be thoroughly wetted, it absorbs a large volume of water, and the life of the fire is much lengthened—with a feeble draught, it might even be doubled; but with lumps of coal the effect is much less.

Since the pink powder consists chiefly of common salt, the effect of dissolving a quantity of salt in the water was tried; but no further diminution in the rate of combustion was observed.* A salt more fixed in the fire, such as sodium sulphate, would doubtless be more efficient; but some heat is lost if coal or coke is wetted, and in an open grate neither needs to have its combustibility diminished unless there is an unusually strong draught. When this is the case, an admixture of breeze or small coal, of which there is generally more than enough in a coal-cellar, will check the draught and reduce the rate of burning.

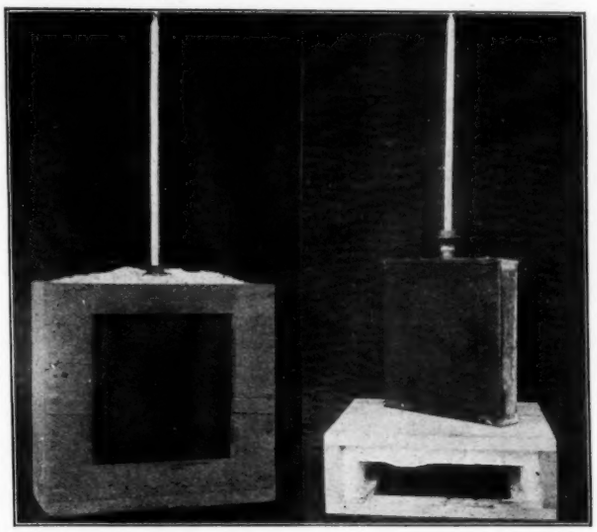
There remains the question of the output of heat. Chemists, and, indeed, everyone who has a little knowledge of chemistry, will agree that the total amount of heat caused by the combustion of a pound of coal will not be increased by the addition to it of rather less than one grain—that is, one seven-thousandth part—of any kind of incombustible material.† But it may be rightly objected that it is not the total amount of heat which concerns the householder, but the amount of heat radiated into a room; and this cannot be so easily and exactly measured. A minute proportion of common salt in the air around an atmospheric burner enormously increases the light radiated from it. Why should not the same agent cause some corresponding increase in the heat radiated from a lump of coal?

A Radio-Thermometer.

The desire to settle this question, by measuring the amount of heat radiated into a room, led me to design, and have made, a little instrument for the purpose, and, having worked with it, to offer to your Society an account of the instrument and the results, and at the same time to bring before you a form of grate, the more remote and the immediate ancestors of which have added to my comfort for some forty years, but whose efficiency with various fuel I have only measured the last few months.

The instrument which, for want of a shorter name, I call a radio-thermometer—that is, measurer of radiant heat—consists of a copper box, 6 in. by 6 in. by 1 in., with a small funnel-shaped inlet, enclosed in a wooden box, 7 in. by 7 in. by 2 in., open at top, with an opening 5 inches square in the middle of one side. Except on this side there is a space between the two boxes, of 1 inch at the back and ½ inch at the sides and below, which is loosely packed with cotton-wool. Of the side which is in contact with the wood the central 25 square inches is exposed and has been blackened. A thermometer is held by a cork in the opening at the top, which is also used as a stirrer, being furnished with a cup-shaped piece of rubber sheet tied on above the bulb, which stretches across the box,

The weight of the copper box is 11 oz., that of the water which fills it is 1 lb. 6 oz. The water-equivalent of the copper box is $11 \times 0{\cdot}095 = 1{\cdot}045$ oz. Hence the mass of water heated may be taken as 1 lb. 7·04 oz., or 1·44 lbs. The instrument having been freshly filled with cold water, is placed facing the middle of the fire at a distance of 3 feet. Exactly at some minute by the watch the thermometer is read. About nine minutes later the water is briskly stirred up and down with the thermometer, which is then replaced with its bulb central, and at the end of ten minutes the thermometer is again read. These readings are repeated every ten minutes until the temperature of the water is as much above the temperature of the air, taken by a thermometer at the back of the instrument, as it was below it at starting. The cotton-wool, which checks the flow of air round the box, prevents the temperature of the air of the room having much influence; and both this and the exchange of radiations are approximately balanced by the temperature of the water being to an equal extent, and for nearly the same time, first lower, then higher, than its surroundings.



The Radio-Thermometer arranged for Use.

The Copper Box holding Water—with the Thermometer and (beneath) the Wooden Box in which it is enclosed.

A set of observations thus made generally occupies nearly an hour, and gives an average result for that period. To make the results, when at different times the fire was larger or smaller, more comparable, an estimate was made, every ten minutes, of the area of fire from which the chief part of the heat was being radiated, as being so many spaces. The bars being 18 in. long with 2 in. between them, a space was 36 square inches. Though each estimate was only approximate, the average will not have been far wrong.

An example will show the plan which has been followed:—

Feb. 25, 1915. *Barometer*, 30·2. *Temperature of Air in Room*, 57°. *Grate Charged with Coke. Fire Lit at* 8 *a.m.*

Time.	Temp.	Rise in 10 Mins.	Spaces.	Balance of Temperatures.	
	° F.	° F.		° F.	° F.
IX. 26	35 8	..	3·0	..	..
36	41 6	5·8	3·3	57·0	78·5
46	48·0	6·4	3·5	35·8	57·0
56	54·7	6·7	4·0	21·2	21·5
X. 6	62·2	7·5	4·3		
16	70·4	8·2	5·0		
26	78·5	8·1	5·0		
Average		7·12	4·0	Average rise for 1 space	1·78°

The heat radiated from 36 square inches of fire-front, corresponding to a square 6 inches in the side, upon a surface of 25 square inches, at a distance of 3 feet, in ten minutes, raised the temperature of 1·44 lbs. of water 1·78° Fahr. Since all these measures but the last are constants of the method, the result may be called 1·78 units.

If these units, which serve for the comparison of one grate or one fuel with another, are multiplied by 25·2, the total amount of heat sent into the room every minute from each 6 inches square of the front of the fire, is given in British thermal units.*

* An analysis of the powder made for me by Mr. R. E. Steel, Natural Science Master at Sherborne School, gave the following result:

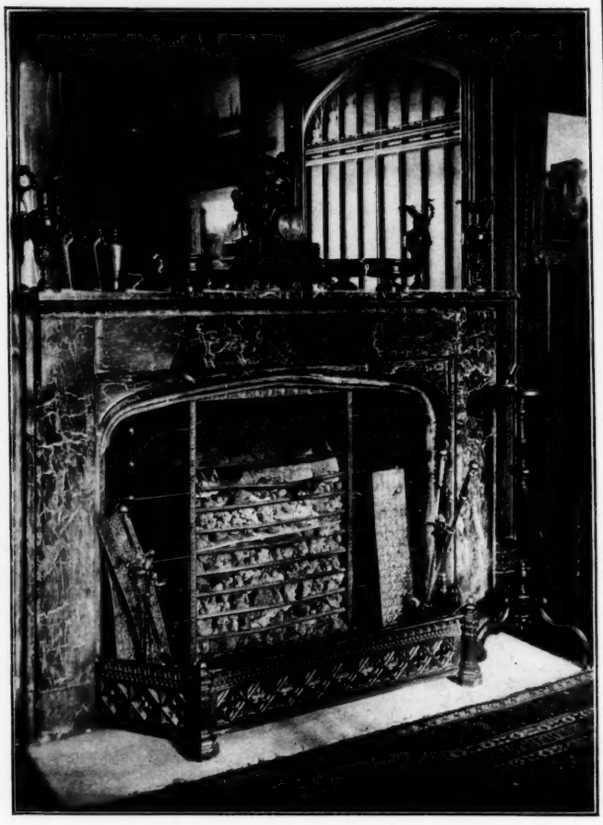
Sodium chloride	83·85
Calcium carbonate	8·71
Ferric oxide	2·88
Silica	0·69
Water	3·57
	99·70

† One heaped-up teaspoonful is to be sprinkled over 1 cwt. of coal or coke. Four heaped-up teaspoonfuls weigh about one ounce, whence approximately 64 weigh one pound, and 7168 1 cwt.

* $\frac{1{\cdot}44 \times 175}{10} = 25{\cdot}2$. Multiplication by 1·44 increases the result to what it would have been if only 1 lb. of water had been heated. Division by 10 reduces it to what it would have been if the heat had only been applied for one minute. 175 is an approximate estimate, furnished me by Mr. Sydney Lupton, of the number by which the heat falling normally upon a surface of 25 square inches must be multiplied to represent the total heat radiated in front of the fire in every direction.

Some Experiments.

A large number of measurements have been made of heat radiated from coal and from coke, and from coke which had been wetted, and from coal and coke treated with the pink powder in the manner prescribed. The grate chiefly used was that of which I have here an example, whose division into many spaces and flat vertical front adapt it for this purpose. The whole charge of fuel is put in at once, and heaped up above the top bar into the throat of the chimney before the fire is lit. The fire burns gradually downwards, like a candle, and lasts the day through.



A Dining-Room Fire-Place with Coke-Burning Arrangement.

The average results, in units of the method, are as follows: Coke, 1·97; coal, 1·63; wet coke, 1·29; coke or coal sprinkled with water and powder, 2·03. The numerical results are given, but must only be regarded as rough approximations indicating little more than the order of magnitude. The precaution was taken of allowing the fire to burn for some time before measurements were made, both that the chimney might have attained its full temperature, and that a sufficient space might intervene between the top of the fire and the opening of the chimney to lessen the effect of the draught up the chimney. Even so, the effect of wind—and probably also, though in a less degree, of outdoor temperatures and moisture—is such that observations would need to be made over a long period if a more accurate average were necessary.

The actual results are intelligible and probable. Coal when it burns passes through two distinct stages. First it gives off gas, some of which burns, while some (not coming in contact with anything sufficiently hot, or being mixed with too much steam or nitrogen) escapes unburnt. When the evolution of gas ceases, the coal has been changed to coke, and the second stage begins. Thenceforward it burns with a steady glow. Much less heat is radiated out during the first stage than during the second; the heat from the burning gases goes chiefly up the chimney. Thus, when the heat from a coal-fire is fairly measured, some parts being in one stage and some in the other, the result is lower than when all is in the second stage or, which is the same thing, when coke is being burnt. Wet coke, if sufficiently wet, gives still less heat at any moment, for it burns more slowly, and some of its heat goes to evaporate the water. When the fire is dull-red, the steam from water beneath escapes and makes no sign; but when the upper part is glowing brightly, the steam is successively decomposed and recomposed, the pale flame of hydrogen, though mixed with an equal volume of carbonic oxide, being distinguishable from the blue flame of carbonic oxide, which air without steam produces.

Coke treated with powder or untreated radiates practically the same amount of heat—a result which will not surprise members of this Society. Bulk for bulk, coal is nearly twice as heavy as coke, burns for longer under the same conditions, produces more heat, and from an open grate radiates rather more heat, because it lasts longer. Weight for weight, coke has the advantage for domestic use, and would retain it even if (through increased demand) the price of the two were the same. If public benefit can be brought into account, the advantage of the use of coke for domestic fires is very great. The fires are smokeless. I hope some member of the Smoke Abatement Society may be here who will tell us how London and other great residential cities and towns would benefit if the chimneys of houses sent out no smoke. Nearly one-quarter of the coal consumed in the United Kingdom is burnt in domestic fires.

A Downwardly Burning Coke-Grate.

The grate of which, in conclusion, I have still to give a description, or rather one of its predecessors on the same principle, was used with coal only for many years, and used to be nearly smokeless after the first hour. By that time, the top layer of coal had passed through its first stage of flame and smoke, and had become a layer of glowing coke. Through this layer the gases given off as the heat spread to the coal beneath, with their light burden of particles of soot, had to pass on their way to the chimney—all that was combustible, whether gas or soot, was burnt, and thenceforward for the rest of the day the fire was smokeless. A few years ago it occurred to me it might be well to mix coke with the coal. The proportion of coke was gradually increased, and latterly I have used coke only, except that for lighting the fire a few pieces of coal are helpful, as well as paper and wood.

Where a fire is needed for a short time only a gas-fire is best. One of these, with good pressure and a consumption of about 35 cubic feet of gas per hour, gave as much heat as three spaces of the coke-fire, or as a good drawing-room fire of the ordinary type. For equal times of burning, the cost of the gas-fire is much greater. The charge of coke which fills the grate and maintains a good fire for fourteen hours (as from eight a.m. to ten p.m.) is 34 lbs., which, with coke at a peace price of 18s. per ton, costs only 3¼d. Gas giving as good a heat, and burning at the rate of 35 cubic feet per hour for the same time, would, at the rate of 2s. 6d. per 1000 cubic feet, cost nearly 1s. 3d. But when a fire is needed for only half an hour or an hour, as in a dressing-room, the immediate lighting and extinguishing, together with the absence of all trouble of emptying ashes, cleaning, laying and lighting, turns the scale in favour of gas.

In the construction of a grate to yield as much radiant heat as possible from the fuel consumed, certain principles should be observed: (1) The face of the fire should be vertical, so that the chief radiation should be horizontal, not directed upwards towards the chimney and the ceiling; (2) the bars should be as slight as is compatible with sufficient strength, and as wide apart as will suffice to prevent more than an occasional ember falling out; the reason is that the bars do not reach a red heat, nor radiate so much heat as an equal surface of the fire behind them, and to the extent of the difference they act as screens; (3) for a similar reason the fire should be narrow from back to front. A space of 4 or 4½ inches between the back and the bars is enough; only the glowing surfaces which can be seen from in front radiate heat into a room, and lumps of fuel which hide other lumps and the red-hot fire-brick behind them, act as screens, whether they themselves are dark or glowing; (4) air should pass in through bars in front, not through bars beneath, for the most vivid combustion occurs where the air and fuel meet. If this is at the bottom of the fire, much heat is radiated on to the hearthstone below, and helps to send a current of heated air up through the fire, promoting the burning of the coal, but not to good purpose; (5) to save the trouble of frequent attention and replenishing from a coal-scuttle during the day, and to avoid smoke, it is well to put in at once all the fuel the fire will need and to light it at the top; (6) coke burns down more quickly than coal, and thus, especially with coke which has been "graded," and the light combustible coke from vertical retorts, the fire may reach its full heat near the middle of the day when its services are less needed than earlier or later. Control of the fire can be obtained by means of an iron plate put in when the fire is being laid, half-way up, resting on two or three lumps of coke only, that air may circulate underneath and prevent it becoming so hot as to ignite the coke beneath. When the fire is low the plate is pulled out, and the lower half of the fire makes a fresh start. (7) Some means are needed for drawing up the fire when it is low. Either plates may be hung on, one beneath the other, or folding doors may be arranged to close the upper part of the grate, and so concentrate the pull of the chimney upon the face of the fire beneath.

The grates have been constructed on these principles. A serious difficulty has had to be met, for which there is no scientific solution. The grate must not be less attractive in appearance than other grates. Its simple character and the unavoidable display of a large unrelieved surface of coke or coal make this difficult. I appealed, but unsuccessfully, to a well-known artist who has professed a keen interest in smoke abatement. More recently, I communicated my ideas to an architent, Mr. George Herbert Kitchin, of Winchester, of whose taste and skill I have had experience, asking him to do what was possible towards producing an attractive design and to arrange for the manufacture of grates in accordance with his design. [The author showed on the screen illustrations (1) of coke-grates as they have been in use in his house for many years past; (2) of Mr. Kitchin's designs, embodying some recent improvements in construction as well as in appearance.] The second of the two, which has the disadvantage of departing still further from established forms, will utilize a larger proportion of heat from

the fuel consumed. The charge of fuel compared with that of the flat grate is nearly the same—namely, as 75·4 to 72; the front of the fire, with whose area radiation varies, is as 25 to 18, or one-third greater. The back of the grate is formed by an 8-inch pipe of iron, or perhaps better of fire-clay, admitting air below and discharging it into the room at the level of the top of the fire. Much heat is thus utilized which would otherwise pass up the chimney. Which of the two designs is the better looking, or whether either is sufficiently good looking, is a question on the answer to which their future usefulness (for which I hope) must largely depend.

DISCUSSION.

The CHAIRMAN said they had listened with great interest to Dr. Harcourt's paper, which contained at the beginning a surprise—the way in which he had courageously exposed certain claims occasionally made upon the public credulity in regard to the influence of powder upon the lasting power of a ton of coal. Dr. Harcourt had expressed the hope that some member of the Smoke Abatement Society present would tell this Society of the benefit that would accrue to the great cities and towns by the abolition of smoke from the domestic chimney. He (Mr. Goodenough) was a member of the Smoke Abatement Society; but he did not think he would be equal to explaining the magnitude of the benefit; but he thought it was a fairly obvious one. It had been pointed out in that very room that the result of the diminution of smoke, both from factory and domestic chimneys, in recent years had been to increase the average hours of sunshine by something like 80 per annum. Knowing the vitalizing power of sunshine, it was not possible to doubt the advantage which would accrue to London from a further diminution, or the final abolition, of the smoke nuisance. The solutions of the smoke trouble Dr. Harcourt had fairly indicated in his paper—the use of gas and of coke. In a paper recently read in that room, Mr. H. M. Thornton had shown the extent to which gas was displacing the cruder form of fuel for industrial purposes, and everyone knew the rapidity with which gas had been taking the place of coal in domestic service. The coke-fire which Dr. Harcourt had shown that night, and his testimony as to its satisfactory use in his house for so many years, would he (the Chairman) believed and hoped, lead to a considerable increase in the use of coke for domestic purposes. The ideal was coke for constant use, and gas for intermittent use; or gas for constant use where the labour-saving justified the extra expenditure to users willing to pay (as many users were) for the advantages to be obtained from what was a relatively expensive fuel used constantly hour by hour. Only that day there had come to hand [see the "JOURNAL" last week] the results of some investigations by a Committee of the Manchester Corporation on the question of the use of gas and coal fires at the Town Hall. The tests showed that, although coal was somewhat cheaper than gas where rooms were heated continuously, gas was more economical, and produced a more rapid rise of temperature, in cases where the fires were required intermittently. For this reason, gas-fires were to be adopted for heating the rooms in the Town Hall that were used temporarily; and by their use there would be much saving of labour, dust, &c. In considering the question of the employment of gas as against coal, it was necessary to regard the domestic budget as a whole, and not merely the fuel bills one against the other. This was an important point to bear in mind.

Mr. L. B. ATKINSON expressed his gratification that Dr. Harcourt had scientifically disposed of the extravagant claims made for the use of a certain powder with coal. The author had also shown them how coke might be successfully burnt in a fire. Although much had been talked about this question of heating, it was extraordinary how little they had got to the root of the question. On the whole, what was required, and what one found by experience, was that it was more comfortable to have the bodies in a room—the furniture, walls, and human legs—warmed by radiation, and then the temperature of the air raised from these bodies, than to have the air heated directly by convected heat. Probably, some balance between the two was more convenient. In his own house, by a central hot-water apparatus, the air was kept heated to about 55° Fahr.; and for the purpose of "sitting around" in the evening, they had fires in the grates. This was probably the most convenient way—heat the air to so much, and then rely on radiant heat. The real efficiency of a fire was how many thermal units it sent into a room. The only tests he knew of on this point were those carried out in 1905 for the new block of Government buildings at the corner of Whitehall and Great George Street. The results were published in the "Lancet" in 1906. They often heard it said that 90 per cent. of the heat from a coal-fire went up the chimney; but these tests showed that, of the total heat of the coal burnt, only between 8·7 and 14 per cent. was lost as flue gas; and some 76 per cent. was used in heating the room. Very few people were aware that coal grates had reached this stage of efficiency. Regarding coke, he thought gas companies did not realize the damage they did themselves by not drying the coke before selling it. Through the water, the final result in heat was not what should be got from the weight of carbon in the coke.

Professor WYNDHAM R. DUNSTAN, F.R.S., was glad Dr. Harcourt had done what a great number of them had not had the courage to do—that was, to expose one of those ingenious frauds which were from time to time perpetrated upon the uneducated public. He used the word "uneducated" advisedly, because he felt one was not really educated until one had learned the art of scientific observation. He had been very much interested in Dr. Harcourt's exceedingly ingenious instrument which he called a radio-thermometer, which he (Professor Dunstan) ventured to think might perhaps help to solve some of the problems suggested by the last speaker. It was true that, in warming a room by a fire, they had to have regard to both the radiant heat and the heat that directly warmed the air; and this instrument would enable them to distinguish between the two forms of heat. There was one disadvantage in the use of coke, and it was that a coke-fire required more attention than a coal-fire. He believed the real solution of the smoke question was the use of gas, and that they would sooner or later all be converted to the use of gas-fires. There was another point he recommended to the Chairman and the other representatives of the gas industry present—that was, the price of gas for heating. If they could get cheap gas, they would have smokeless fires.

Dr. T. M. LEGGE suggested that the tiles used for ornamental purposes round fires should have rough surfaces and not highly polished ones. The tiles should break-up the light, and not reflect it. He also commented on what he described as the "appalling" price one had to pay for gas for heating. If gas companies could devise some simple automatic method by which, after a gas-fire had been alight for a time, it would of its own accord go back to its most economical point of burning, there would be an enormous increase in one's appreciation of these fires.

Mr. JOHN SLATER, F.R.I.B.A., pointed out that the great efficiency of grates had been brought about by diminishing the depths of the fuel—that was to say, the old grates had a considerable depth from front to back; but in the new types, this had been diminished. This was one great element in success. With reference to gas-fires, he had considerable sympathy with the remarks of the last speaker. He (Mr. Slater) had recently installed in a couple of flats a number of gas-fires and a water-heater, furnished with a thermostat. He was told by the gas company that, with this heater, he would get hot water all day long with a small expenditure of gas. The first quarter, he found he had used 84,000 cubic feet—this was for a water-heater, two fires, and a small gas-stove used for making toast. The gas company thought this was excessive, and said they would like to make a test. He made one and found he was using 850 cubic feet of gas per day. Electricity companies supplied current for heating at a lower price than for lighting; and it would be a great advantage if gas companies would instal a separate meter and supply gas for heating purposes at a lower rate. This would induce people to put in a larger number of gas-fires.

Lieut.-Col. ALAN CUNNINGHAM said Dr. Harcourt's coke-grate appeared to be an unusually high one. It seemed to him that it would have the disadvantage of having a different efficiency at different levels at different times of the day. What, too, became of the ash? There must be an accumulation of ash as time went on. Did not this ash interfere with the passage of the air through the coke? The disadvantage of admitting warm air into the room through outlets from the back of the fire was that this air dirtied the surroundings.

Mr. THOMAS POTTERTON said that he had put in an installation for warming his house throughout with coke and radiators. He warmed the house up to 63° on the ground floor, to 58° on the first floor, and to about 56° on the upper floor. In November he started the installation, keeping a record of inside and outside temperatures. He went through November, and then he had a difficulty to get coke; but he had obtained the information that he desired. In his house he had 27,000 cubic feet of space. He found that (the average temperature outside being about 42° Fahr.), if he stoked the fire at 7 o'clock in the morning with 28 lbs. of coke and again at 7 o'clock in the evening, he was able to maintain on the ground floor a temperature of 63° or 64° with slight variation. There were rather severe frosts about the middle of November; and he then found it necessary to increase the coke consumption, to get similar results, to 42 lbs. in the morning and 42 lbs. in the evening. This went on day after day. The coke was weighed, and all the records were checked. Then there was some milder weather; and he only stoked up to 21 lbs. morning and evening. His average heating temperature was about 105° Fahr. at the radiators; and he had 40 feet of radiation surface for every 1000 cubic feet of space for the lower rooms, and 20 feet per 1000 cubic feet in the other rooms. The average cost was 56 lbs. of coke per day; which would be about 6½d. for the twenty-four hours. He satisfied himself he could in winter heat his house by coke at 13s. a chaldron for slightly over ¼d. per hour.

Mr. HAROLD HARTLEY (Warrington) said there were one or two points he should like to make in connection with the paper. The first was as to the accuracy obtainable by Mr. Harcourt with his radiometer. This question of a suitable radiometer for the determination of the heat radiated from a source was one which had been of particular interest to those of the audience who were occupied with the manufacture and construction of gas-fires. A short time ago there was published a description of a radiometer constructed on somewhat similar lines to that of Mr. Harcourt for use in this particular connection. If he (Mr. Hartley) was not mistaken, the first suggestion put forward to employ a closed vessel containing a known amount of water for the determination of the heat radiation of a source was made by Pouillet, whose work was criticized on the score of thermometer lag—a criticism which it would appear *primâ facie* might be advanced in connection with Mr. Harcourt's instrument, in view of the effect of the uneven heating of the vessel on the extent of the cooling occurring during the test. Afterwards, Violle suggested

that a blackened thermometer should be employed in a closed space. The radiometer which he (Mr. Hartley) mentioned as resembling the one Mr. Harcourt had designed [see "JOURNAL" for March 30, p. 794] consisted of a metal body—say, copper—of high conductivity, suspended in an enclosure maintained at constant temperature, through the casing of which enclosure some water was circulated. This radiometer was employed by its designers in connection with the Leeds test for the determination of the efficiency of gas-fires. When they were working with this instrument, they endeavoured, in the first instance, to do away with what was called the cooling correction, and to start with the initial temperature (say) 3° or 4° below the room temperature, and arrange the experiment so that the mean temperature of the block during exposure to the fire was the same as that of its surroundings. Such tests, compared with those in which the cooling correction to be applied was carefully estimated, led to the conclusion that they would not be justified in assuming that the amount of cooling under the first conditions when the block was above the room temperature balanced the absorption of heat when the block was below the room temperature. Their conditions were somewhat different from those of Mr. Harcourt. In their own case, they had a mass of metal which weighed about 10 lbs., and the temperature rise was about 6° C.; the period of exposure being six minutes. Using metal of high conductivity, the lag of the thermometer behind the temperature of the front face did not appreciably affect the accuracy of the results obtained—the temperature gradients which existed throughout the block would not interfere to an appreciable extent with the accuracy of the results. He (Mr. Hartley) would also be interested to know what concordance Mr. Harcourt was able to obtain in successive tests when his fire was burning a known type of coke, at a rate more or less under control. Mr. Harcourt quoted 1·97 as an average result in units. What would Mr. Harcourt obtain if he repeated his test? The other point which occurred to him (Mr. Hartley) in reference to the description of this coke-fire was that of ventilation. Unfortunately they were in present-day rooms dependent upon the exits provided by the fire-places for their ventilation. If he understood the author of the new grate right, it was suggested that the whole of the space should be filled up with coke, which, of course, would not entirely stop the passage of the air up the chimney or the fire would not burn. But nevertheless the mass of fuel in the fireplace would probably interfere materially with the volume of air which would pass through the room, and up the chimney. He would be glad to know if Mr. Harcourt had conducted any tests as to the ventilation with the type of coke-fire suggested.

Mr. A. H. BARKER (University College) said Mr. Atkinson stated that the tests made with coal-grates at the Government offices at the corner of Whitehall and Great George Street had never been challenged. He (Mr. Barker) had never seen such an absurd exhibition as these so-called tests were. He did not know who made the tests, nor who was responsible for the incompetence exhibited by them. That 76 per cent. could be taken as the efficiency of a coal-fire he was quite sure was worthless. There was no such efficiency obtained from a coal-fire. He had made a good many tests; and he was quite confident in speaking in this way.

The CHAIRMAN remarked that if Mr. Atkinson wanted his coke dried before he purchased it, he must be prepared to pay a stiffer price for it, because the labour involved was very considerable. The percentage of water in coke was by no means a heavy one. It was only the water required for quenching the coke as it left the retorts. As to the question of the price of gas for different purposes, there was no similarity at all between gas and electrical undertakings with regard to differential prices for lighting and heating. In justice to consumers of gas for lighting, they could not, he was of opinion, charge a different price for heating. There was no particular appreciable advantage to a gas undertaking in regard to whether gas was used in the day time or at night time in view of the capacity for storage; whereas in the case of an electricity undertaking, the demand had to be met as it occurred, and there was thus a great advantage in getting a day load to keep the otherwise idle plant going in the day time. The only advantage to the gas company would be in the reduction of the capital cost for storage, which would not justify any differential charge. It should be borne in mind that the price of gas in London and throughout the country was steadily diminishing, until the recent rise in price, for which nobody outside Germany could be held responsible. But of late years the trend had been to greatly reduced prices, owing to more economical and scientific manufacture. Another factor which had cheapened the cost of gas for heating had been the greater efficiency of gas-fires, through increasing the amount of radiant heat given off in proportion to the gas consumed. He had much pleasure in supporting the motion for a vote of thanks to Dr. Harcourt for his paper.

The motion was heartily carried.

Dr. HARCOURT, in the course of his reply, said that he had not seen the report to which Mr. Atkinson had referred. An error must have come in at some point. The proportion of the heat due to the consumption of coal which was radiated into a room from an open grate was more nearly 8 or 10 per cent. than 76. Mr. Dunstan had said that a coke-fire required more attention than a coal-fire. This was not so with the grate he (the speaker) had used. No coal-scuttle was needed and very little poking. There had been a great improvement in gas-fires; all that was incandescent was now in the front. It was bad economy to turn the gas down; the right plan had been adopted—that of giving the means of putting out altogether some of the burners. Colonel Cunningham had spoken of the change in the level of the fire in tall grates as a disadvantage, and also the accumulation of ash; but he (Dr. Harcourt) had not suffered from either. The accumulation of ash might serve, as another powder was said to do, to lengthen the life of the fire; but mainly, there being always some movement in a fire, it ran down to the bottom like the sand in an hour-glass. Fresh air which had not been in contact with the fire, but which passed up a pipe forming part of the back, would not be dirty. He hoped that he had avoided the "lag" of which Mr. Hartley had spoken in his interesting contribution to the discussion, by using a vessel of thin copper plate and stirring the water before reading the thermometer; also by testing at such a distance from the fire that the rise of temperature was very gradual—generally about 5° or 6° Fahr. in ten minutes. The results of the testings were fairly concordant; but variations were due not to errors of measurement but to changes in the fire. It was only at starting that access to the chimney was at all limited by the fuel. Plenty of hot air passed up the chimney. Almost all the water which was thrown upon freshly-drawn coke went off in steam. When coke was immersed in water, it took up a very large volume, showing that it did not bring much with it.

REMOVAL OF CARBON BISULPHIDE FROM GAS.

The number of "Het Gas" for the past month contains an account by Heer Teune, of the Amsterdam Southern Gas-Works, of some experiments carried out by him in connection with the removal of carbon bisulphide from coal gas. In the "Journal für Gasbeleuchtung" for 1893 (p. 537), it is stated by Heer Goono that he succeeded in removing from 40 to 70 per cent. of the carbon bisulphide by passing the gas through spent oxide containing a high proportion of sulphur. The theoretical basis of Heer Goono's experiments was the fact that sulphur is soluble in bisulphide of carbon; and he inquired why the reverse should not take place—*i.e.*, why a large quantity of sulphur should not dissolve small quantities of bisulphide of carbon. If, in fact, it should do so, it would be recommendable to have a purifier-house of larger superficial area, in which the last box would be filled with spent oxide of iron.

In order to test the accuracy of the theoretical speculations of Heer Goono, experiments were carried out at the Southern Gas-Works. The purifying-boxes, two in series, measured 6 inches each way; and as the passage of the gas was in an upward direction, its length of travel was 1 foot. The boxes were filled with spent oxide containing 23·6 per cent. of water, 32·3 per cent. of sulphur, 6·3 per cent. of prussian blue, and 1·15 per cent. of ammonia. The experiments were varied by taking different temperatures and increasing the speed of the gas. The absorption of carbon bisulphide was measured by estimating the total sulphur in the gas at the inlet and outlet of the boxes. Though the total amount of sulphur in coal gas is due not only to carbon bisulphide but also to other sulphur compounds, its estimation throws light on the quantity of these compounds removed from the gas by absorption in the purifiers.

The following are the results of Heer Teune's experiments:—

Speed of the Gas. Millimetres per Second.	Duration of Contact in the Boxes. Seconds.	Sulphur Absorption. Percentage of Total Amount.
0·41	781	9·85
0·52	615	9·47
0·60	533	6·36
0·61	524	14·08
0·91	352	11·56
1·70	188	7·62
2·30	142	7·24
2·70	119	5·32
2·90	111	3·83
3·10	103	10·30
5·10	62·7	1·94

These figures differed greatly from those of Heer Goono.

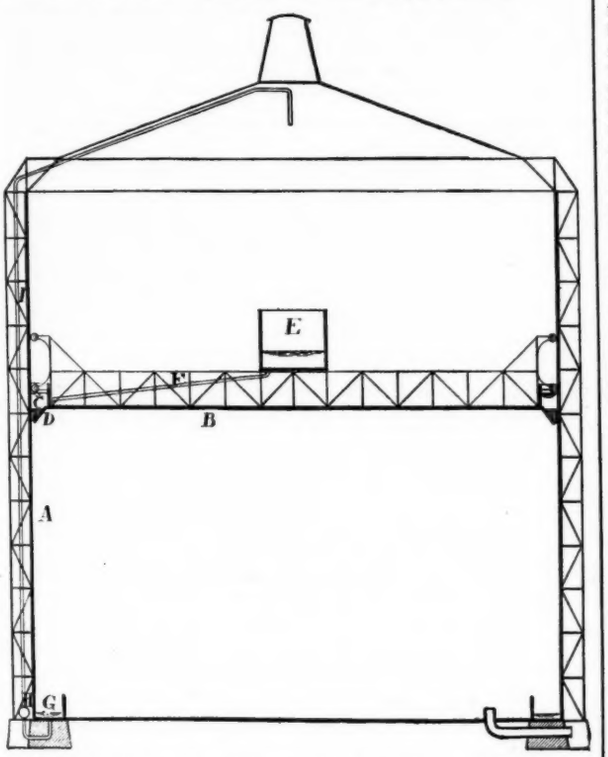
As sulphur has to be the active solvent in the mass, increased activity may be expected if Heer Goono's theories should prove to be correct. The spent oxide was therefore mixed with 16·7 per cent. of flowers of sulphur, and with this mixture a fresh series of experiments was made. The results were practically the same as before; the absorption of sulphur being 11·45, 9·8, 5·1, 4, and 8 per cent. of the total quantity present in the gas. Finally experiments were carried out with pure powdered sulphur as an absorbent; and consequently the maximum activity might have been expected. But in this case also the theory failed, and the figures are much the same as in the previous experiments; the absorption of sulphur being 10·9, 12·8, 6·7, 3·7, 4·5, 10·1, and 8·1 per cent. of the total contained in the gas.

The experiments therefore show that, though sulphur in a finely divided state has a slight dissolving capacity for the carbon bisulphide in gas, it is so slight that no practical purification process can be based upon them. The figures of 40 to 70 per cent. absorption given by Heer Goono are, therefore, much too high.

The late Colonel Henry Oakden Fisher, the Chairman of the Cardiff Gas Company, and of other gas and water undertakings, whose death was recorded in the "JOURNAL" for the 12th of January last, left estate of the value of £110,112.

A GASHOLDER WITHOUT A WATER TANK.

Early this year a description was given in the "Journal für Gasbeleuchtung" of a type of gasholder having no water tank, which has been designed by the Augsburg-Nuremberg Engineering Works (generally known in Germany by the initials "M.A.N."). The construction of gasholders without a water-seal has been often attempted, but the difficulty of keeping a dry seal in sound condition is very great. It does not follow, however, that because a water-seal equal to the holder pressure of 4 to 8 inches cannot well be dispensed with, it is necessary to retain a tank having a depth of 30 feet or more. In the tank described the depth of the water-seal is merely slightly greater than the gas pressure.



A. Wall of holder. B. Partition travelling vertically. C. Liquid seal. D. Sliding block. E. Liquid feed-tank. F. Feed-pipe. G. Receiver. H. Pump. I. Rising main for liquid.

A German Gasholder without a Water Tank.

The illustration shows the design of the new holder, for which a German patent has been obtained. The water-seal C travels with the disc or ring B, and keeps the holder gas-tight in that direction, while the travelling slide or block D prevents the water of the seal escaping through the intervening fissure, or at least reduces the loss to trifling proportions. Any such loss of water from the seal is made good by water flowing from the feed tank E, which again is filled up automatically from the annular receiver G by the pump H and the rising main I.

As there is no loss of the liquid used for the seal, any suitable liquid may be employed in place of water, and ordinary gas tar has been found very good for the purpose, and has the advantage that it is unnecessary to warm it to prevent freezing in winter time. Tar and similar liquids pass only to a very slight extent through the very narrow slit, especially as the pressure is kept nearly the same on both sides of the holder partition. Measurements have shown that, with a holder of 880,000 cubic feet capacity, the pumping of the tar used as a sealing material would entail an expenditure of only 0·1 H.P. on the average, whence it has been calculated that with power costing 1·1d. per B.T.U. the annual expense of pumping would be only 3 per cent. of the customary expense (in Germany) of heating a gasholder having water-sealed cups. The abolition of heating apparatus renders the gasholder more reliable than one with water-sealed cups.

The cost of erecting the new type of holder on unfavourable ground is also very much lower than that of a holder with water tank, as the load on the foundations is comparatively trifling. No inside painting of the holder is required, since the walls on the inside are protected by the tar. The outside also is not exposed to the ill-effects of tank-water, and is dealt with in the same way as any exposed iron structure. The holder may be enlarged at any time by merely extending upwards its wall A. In appearance, it is better than an ordinary telescopic gasholder.

An experimental holder of the new type has been erected at the Gustavburg works, where it may be seen, and one of 45,000 cubic feet capacity is in course of erection at the Augsburg works, the contract price being the same as that of an enclosed holder of the ordinary type of half the capacity. A model of a holder of the type was exhibited at the Munich Gas Exhibition. The advantages claimed for the new holder are: (1) Small first cost; (2) small working expenses; (3) abolition of the water tank; (4) abolition of cup or seal heating; (5) great trustworthiness in action; (6) simplification of re-painting; (7) accessibility of all parts, even while in use.

INCLINED RETORTS AT DECATUR (U.S.A.).

About two years ago the horizontal retorts at the Decatur (Ill.) Gas-Works were nearly worn out; and the question of replacing them by new ones or introducing a different system of carbonization came under consideration. After a careful inspection of modern plants, and visiting several up-to-date installations of various types, it was decided that benches of inclined sectional retorts with silica settings would operate with a minimum of labour, bench fuel, and repairs, and would produce a maximum amount of high quality gas per ton of coal. Additional land adjoining the old gas-works was purchased, and a new coal-gas unit, with the necessary auxiliary equipment, was constructed. At the last meeting of the Illinois Gas Association a description of the installation was given by Mr. R. B. Richardson. From it, the following particulars have been taken.

There are six full-depth benches of six inclined sectional silica retorts, 15 feet long, and all auxiliary ironwork and connections, located in a house of steel with corrugated asbestos roof and sides. One radial brick chimney stack, 42 inches in diameter and 70 feet high, furnishes sufficient draught for all the benches. In addition to this there are a steel trestle crossing a concrete coal-pit, coal and coke handling machinery and apparatus, and the necessary gas, steam, and water pipes.

The coal is received in hopper-bottom cars, which are either dumped into the pit or into the track hopper. From this it is carried by a steel apron conveyor to the crusher, whence it falls into a bucket elevator and is carried up to the overhead coal bunkers of the retort-house, which have a capacity of 150 tons. It then flows through four valves into three travelling lorries, from which it is fed by gravity into the retorts. In emptying the retorts, the coke falls first into water-sealed quenching-bins. After it is quenched and cooled, it is discharged into a coke-car which is raised on an electric elevator and run out on an overhead trestle, whence it can be dumped into freight cars, waggon-loading bins, or on to the coke-storage yard. The coke used for feeding the furnaces is charged directly from the retorts into the generators. All the coke and coal machinery is driven by three-phase alternating-current electric motors.

Four of the six benches were brought into operation on the 1st of June last year. Later the fifth bench was put on, and they have been in continuous use ever since. These five benches are worked with four men and a foreman on the day shift and two men and a foreman on the night shift. The same crew could easily operate all six benches. The three stokers charge and discharge the retorts, fill the furnaces, clean the ascension-pipes, quench the coke, and put it into cars for shipment or into storage-bins or the yard. One extra man elevates the coal and looks after the coal elevator, while the other cleans all the fires, recovers fuel from the ashes, and keeps the grounds in order.

At present there are being carbonized 800 lbs. of coal per retort in six hours. Ten retorts are drawn and charged every two hours; two being opened together. The charging man lifts the doors off at the top, while the two men below open the lower doors, scrape the joints, auger the ascension-pipes, and pull the stoppers. The coke will generally slide out of its own accord. Should it stick because of a green end or a choked retort, the men below loosen the end with light rods, and the man above starts it down. The hot coke either falls into the quenching-bins or is charged into the generators. When it is all out, the men below put in the stoppers, close the doors, and the man above opens the travelling lorry and runs in the coal.

During the drawing period the coke is charged into the generators at the temperature at which it leaves the retorts. The coke which is drawn into the quenching-bins is left there until just before the next draw, allowing for a period of drying. The ascension-pipes are reamered out thoroughly from the top once every 24 hours, and augered from the bottom every draw. The temperature is approximately 2300° Fahr. in the combustion chamber, and from 1900° to 2000° Fahr. in the retorts. The dip-pipes are sealed to the extent of 0·4 inch; and the foul main is under a negative pressure sufficient to maintain a neutral condition in the ascension-pipes.

The following are the working results of the installation for a period of three months:

Yield of gas per pound of coal carbonized	5·5 cub. ft.
Daily make per bench with six-hour charges	101,800 ,,
Average make per man in the retort-house	85,000 ,,
Calorific power of gas per cubic foot	595 B.Th.U.
Make of tar per net ton of coal	12·50 gallons.
Make of ammonia ,, ,,	4·26 lbs.
Bench fuel ,, ,,	355 ,,
Coke ,, ,,	1300 ,,

The yield of ammonia is not yet satisfactory, but is increasing,

having reached 4·45 lbs. per ton of coal during the last month of the period. The low yield at first was due to leaks in the new liquor well and pipe system, and to the installation of a new concentrator. The bench fuel is high, due to the high ash content of the coke, consisting largely of iron, which fuses and forms an extremely hard clinker. The average make of gas per man does not compare favourably with other similar plants, because the men are required to move the coke from the retort-house to the coke-bins and the storage yard.

The writer assisted in the operation of eight benches of inclined retorts in Mobile (Alabama) for four years; and, taking into consideration the first cost, operating expenses, maintenance, and results, he believes this style of plant for the manufacture of coal gas to be without question the best that can be installed in works producing up to 2 million cubic feet of gas per day.

CHAMBER OVENS AT SEATTLE (U.S.A.).

About two years ago it was deemed necessary to increase the capacity of the Lake station of the Seattle Lighting Company. After detailed inspection of examples of modern carbonizing systems, it was decided to erect plant of the chamber-oven type, incorporating all the latest improvements. A description of the installation has been furnished to the "Gas Record" (Chicago), by Mr. W. A. Miller, the Construction Engineer, and from it the following particulars have been taken.

At the time the additional plant was decided upon, the carbonizing equipment at the Lake station consisted of a modern retort-house containing 16 benches of nine retorts each, with charging and drawing machines and coal and coke handling appliances. There was also water-gas plant in operation, comprising three 8 ft. 6 in. sets of apparatus of the Lowe type, located close to the retort-house, with the necessary facilities, elevators, &c., for economically handling the coke produced and used in the generators. The coal and water gas plants were operated as separate and independent units. Each was served with ample condensing, scrubbing, and purifying apparatus; and the results obtained in each were above the average.

The new installation, which was carried out by the National Chamber Oven Company, of Cincinnati, consists of five ovens of the four-chamber type, and with the stack, coal-bins, and elevated floors (upon which the motor-driven machines are operated from end to end in performing the work of discharging the coke from the ovens) occupies a space about 160 ft. by 64 ft. Each chamber is 27 feet long, 8 feet high, and from 15½ to 18 inches wide, gradually tapering from end to end to facilitate the discharge of coke. The capacity is 248 cubic feet, equivalent to about 6¼ tons of coal. The hollow walls separating the chambers are built of silica material of as few different shapes as possible consistent with strength, proper bonding, and simplicity of construction. The vertical flues formed therein connect two main horizontal chambers to which access can be had from each end of the oven to regulate the dampers controlling the proper distribution of the heat within the oven walls.

Each oven is heated by two generators, about 10 feet in depth, and set in front. The fuel used for heating is at times a part of that produced in the ovens, but usually it is the retort-house coke, for the reason that oven coke commands a more ready sale and a higher price, not only for domestic use, but for metallurgical purposes. The recuperators consist of an extensive system of long horizontal channels set immediately under the ovens for heating the air supplied for primary and secondary combustion. Between the recuperators and the main flue, each oven is equipped with a small boiler or evaporator for generating the water vapour required under the grate-bars of the furnaces, in lieu of live steam, and for still further reducing the loss of heat escaping from the ovens to the stack.

On the top of each chamber are three filling mouthpieces fitted with self-sealing lids, hinge lugs, and eccentric levers, through which the coal from the three compartments of the lorry car is discharged into the oven chamber. One of the three mouthpieces also serves as the gas off-take for each chamber, and is connected to the hydraulic by a 12-inch steel stand-pipe.

The ovens are covered by a steel plate floor which extends from the extreme end of the main coal-bin supports to the opposite end of the oven-house. The plates are supported by the main 15-inch horizontal tie-beams over the top of the ovens, together with the 12-inch I-beams supporting the lorry tracks and other intermediate beams. Between the floor and the top of the oven brickwork there is a space of about 18 inches, through which the air circulates; and, as a result, the workmen are not subjected to so high a degree of heat as would be the case if they were compelled to walk directly upon the oven brickwork.

The ovens are served by four lengths of hydraulic main, 36-inch by 48-inch section. One section of it 25 ft. 6 in. long and one 39 ft. 8 in. are set over each end, and connected with alternate chambers by a single 12-inch stand-pipe. Each section of the main is connected with a tar-tank of sufficient capacity to contain the tar produced for one day, and set low enough to allow the tar to flow thereto by gravity—displacing the ammoniacal liquor previously contained, which returns to the hydraulic main and to the overflows regulating the depth of dip-pipe seal, and thence to well. The foul mains are parallel with the hydraulic main, and are supported by the steel frame of the oven-house extending to the end, then across an elevated bridge, spanning the space over the operating floor traversed by the pusher machine, and connecting with the air condensers, of which there are three, 23 feet high and 9 ft. 6 in. diameter, equipped with 24-inch pipe connections, 8-inch tubes, stack and clean-out plates, and supported on concrete foundations.

The Lake station now comprises two complete coal-gas units, which are operated entirely independently. The addition of which some particulars have been given has been in operation for a period of about six months, and the results are stated to have been very gratifying—much better than those obtained in the retort-house. When using the same grade of coal and producing gas having the same calorific value in both plants, the comparative yields obtained per net ton of coal carbonized in the chamber ovens are as follows: From 8 to 10 per cent more gas; from 8 to 10 per cent. less tar; about the same quantity of coke, but of much better quality; practically the same high yield of ammonia —7½ lbs., which is greater than that obtained in many other gas-works; labour and repairs less.

Masonic—Evening Star Chapter.

The Annual Convocation of this Chapter was held at the Freemasons' Hall, Great Queen Street, last Thursday. After the regular business had been transacted—including the exaltation of Bro. J. F. Wicks and Bro. Corbett W. Woodall, members of the Evening Star Lodge—the installation and investment of officers for the ensuing year took place. Subsequently a P.Z. Jewel was presented to E. Comp. J. W. Broadhead for his services to the Chapter since its consecration. The list of officers of the Chapter for the year 1915-16 is as follows:—

M.E.Z. . .	Ex. Comp.	T. H. Adkins, Prov. G.S B. Surrey, P.Z. 889
H.	„ „	Frederick A. West, P.Z 1602
J.	„ „	W. Thomson
Scribe E. .	„ „	Rae P. Normand
Treasurer .	„ „	W. A. Surridge, P.G. St. Br., P.Z. 1719. 1201, 1397
Scribe N. .	„ „	Arthur E. Eves, M.E.Z. 1201
P.S. . . .	Comp.	William Dommett
First A.S. .	„	A. E. Broadberry
Second A.S.	„	F. W. Cross.
Organist . .	„	C. W. Offord
Stewards .	„	Henry Kearns
	„	George Hands

In connection with the meeting it may be noted that an appeal was made for votes available for any of the masonic charities, in view of the fact that at the next election of the Royal Masonic Institution for Boys the sons of the late Bro. Gordon Walker, of Wantage, will be up for election, and it is urgently desired that success may be secured at the earliest possible moment. Any votes for the purpose may be addressed to E. Comp. Reginald W. Foster, No. 21, John Street, Adelphi, W.C.

French Coke-Making Industry.—The official French statistics, apart from those issued by the Comité Central des Houillères de France which refer to that body's adherents, have for the first time included the output of coke and recovery of bye-products; the figures now available relating to 1912. The total number of cokeries in that year was 38, and the number of ovens 3885, of which 2340 operated with bye-product recovery and 1545 without. Of the total of 4,951,317 tons of coal coked, 431,555 tons represented imported coal, the districts employing this coal being: Gironde, 29,500 tons; Landes, 154,093 tons; Loire Inférieure, 121,296 tons; Nord, 7135 tons; and Pas de Calais, 119,531 tons. The total production of coke is given as 3,667,393 tons, or considerably more than that shown by the returns of the Comité Central des Houillères.

Government Aid for Industrial Research.—A joint deputation from the Royal Society and the Chemical Society was received by the President of the Board of Trade and the President of the Board of Education, at the Board of Trade Offices, last Thursday. Among the members of the deputation, which was introduced by Sir William Crookes, were Professor Smithells, Professor Percy F. Frankland, and Dr. G. G. Henderson (President of the Society of Chemical Industry). The speakers addressed Mr. Runciman in support of memorials from the above-named Societies which had been submitted to the Government on the position of the chemical industries, and the steps which might be taken to improve both their status and efficiency in the United Kingdom. The deputation advocated Government assistance for scientific research for industrial purposes, closer relations between the manufacturers and scientific workers and teachers, and the establishment of a National Chemical Advisory Committee for these purposes. Mr. Runciman, in reply, agreed with the views expressed as to the need of closer co-operation between manufacturers and scientific workers and teachers. The war had, he said, shown the weakness of our position in certain important respects, and he was in full sympathy with the general views expressed by the deputation. The actual proposals would receive careful and sympathetic consideration.

CORRESPONDENCE.

[*We are not responsible for opinions expressed by Correspondents.*]

The International Gas Congress in San Francisco.

SIR,—Your article, entitled "The Forthcoming International Gas Congress at San Francisco," in your issue of March 30 is very much appreciated in California.

From the present outlook, the gas congress is an assured success; and coupled with the magnificence of our Panama Pacific Exposition and the excellent demonstrations of the uses of gas for every purpose within the exposition, and particularly for illumination in successful competition with the latest developments in electricity, we still have fond hopes that there will be a large representation of British gas engineers at the congress.

The most deplorable war which has so upset conditions among our friends will, of necessity, make it more difficult to leave home; but the attractions in California will provide a much needed rest and recreation for the British gas man who comes to the congress; and I feel sure he will return in better shape to take up the arduous duties of the gas business of to-day.

I thank you kindly for the publicity you have given our gas congress.

E. C. JONES,
President, American Gas Institute.

San Francisco, April 21, 1915.

Make of Gas per "Long" or "Short" Ton.

SIR,—In a letter received by me to-day from a gentleman very highly placed in a Colonial Government, and who supervises gas matters, the appended passage occurs. It appears to me that it contains a suggestion which is quite worthy of consideration by engineers who are dealing with statistics of gas undertakings.

> "Another point is that to me it would seem that it would be an improvement if English books, trade journals, &c., would always speak of the make of gas in terms of a pound of coal, instead of a ton. The reason, of course, is that if you speak of a ton you can only infer that it means long or short, according to whether you are speaking of English practice or that over here; and your inference may be wrong. Besides this, the make per pound is a much smaller, and consequently a more convenient, figure to write and perhaps one easier to remember."

I myself have found that certain statements I have made to colonials with regard to the make of gas per ton have been quite misunderstood, or rather understood to refer to a ton of 2000 lbs., and I am quite under the impression that this short ton is regarded in many places out of England as the basis of calculations for gas make, &c., in England.

Westminster Palace Gardens, S.W.,
May 7, 1915.

JNO. F. SIMMANCE.

The Affairs of the Broadstairs Gas Company.

SIR,—Please allow me, as a shareholder in the Broadstairs Gas Company, to support the views of Mr. R. W. Edwards, as expressed in the last number of the "JOURNAL."

It was certainly a surprise to me to find income-tax deducted from the dividend without a word of warning. I wrote to the Company protesting against such treatment of the shareholders as being unfair; and I received what I considered a curt reply, calling my attention to the obscure reference in the Directors' report, and stating that the course had been approved at the general meeting, "having regard to the position and prospects." No word of explanation was given as to the latter; and it is not possible that shareholders from a distance can always attend meetings at Broadstairs.

To have sold new capital in January last on the basis of a dividend of 7 per cent. free of tax, and afterwards to deduct the tax, does not inspire confidence in the direction of the Company's affairs.

The Company pays its dividend yearly, and then not until three months after the close of the year; and I have objected to money being kept in hand for a year, instead of being paid half yearly.

I trust these matters will not be allowed to drop until some amendment is shown in the Company's present methods of business.

London, May 7, 1915.

SHAREHOLDER.

REGISTER OF PATENTS.

Crucible and Melting-Pot Furnaces.

TOOTH, L. F., of the Commercial Gas Company, Stepney.

No. 7635; March 26, 1914.

This invention relates to furnaces of the tilting type heated by gaseous fuel. It comprises an improved form of flue whereby the removal of the products of combustion is ensured, even when the furnace is tilted; also improvements in the mounting of the cover, and means for facilitating the charging of the furnace.

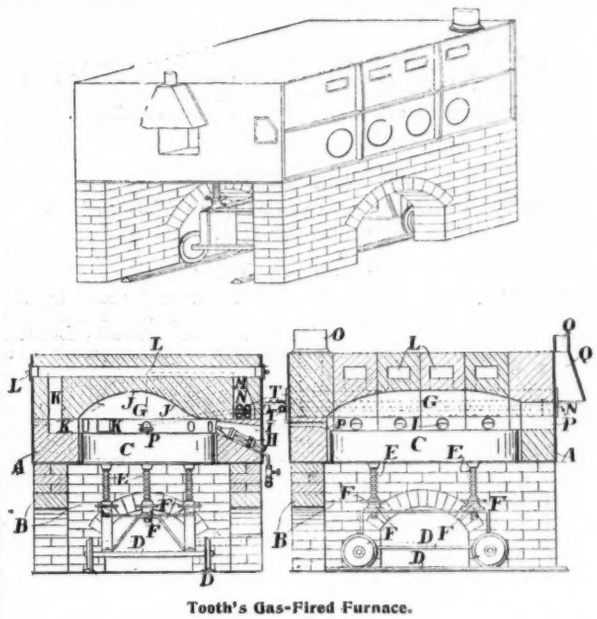
According to the claims made by the patentee, the furnace proper is pivoted in standards, and the means for carrying off the products of combustion from the furnace in all positions comprises a flue fitted to the furnace and bent or cranked so as to enter a hollow sleeve or casing mounted adjacent to one of the pivots of the furnace—this sleeve communicating with a second hollow casing, which is held against rotation and is fitted with an outlet. A bracket extends from one of the standards, and there is a preheater pivotally supported upon the bracket, provided with a charging spout extending obliquely through the wall of it. The cover is carried by a sleeve pivotally supported upon a pin upon the preheater; such sleeve being formed with cam portions adapted to engage with corresponding cam portions on the preheater, so that the cover is raised as it is swung aside. Efficient means are also provided for withdrawing the products of combustion.

Gas-Fired Furnace.

TOOTH, L. F., of the Commercial Gas Company, Stepney.

No. 7633; March 26, 1914.

This furnace is intended for the cupellation or refining of silver, glass-bending, enamelling, and like purposes in which gaseous heating is employed; and it is illustrated in connection with a furnace in which a moveable bottom is supported upon a carriage adjustable vertically for the introduction or withdrawal of the bottom from the furnace, and furnished with wheels running upon rails for the transport of the furnace bottom.



Tooth's Gas-Fired Furnace.

A perspective view of the furnace is given; also a transverse sectional view, and a longitudinal sectional view.

The longitudinal structure A, supported upon brickwork B, is formed with an opening in its base adapted to accommodate the cupel C, to facilitate the introduction and withdrawal of which, and to support it, a wheeled carriage D is adapted to run on rails beneath. Upon the carriage is mounted a number of screwed pillars or supports E (upon which the cupel rests), adjustable by screwed collars F working in fixed bearings on the carriage and furnished with hand-wheels for turning.

Above the cupel is the combustion chamber G, preferably of arched formation and fired by a number of burners H inserted through openings in one side, inclined so that the flames are directed upwardly across the furnace and play upon the arch J, which at the side nearer the burners is somewhat convex and at the opposite side somewhat concave.

Opposite the burner openings are a corresponding number of horizontal outlets K, which lead into vertical flues, each of which leads into a horizontal cross flue L provided with a regulatable opening controlled by a hit-and-miss valve, or the like, for the admission of secondary air, and at the opposite side with a door for cleaning and inspection purposes. Near this (burner) side of the furnace each flue is connected by a vertical flue M to a flue or trunk N running longitudinally through the furnace and leading by a vertical flue O at one end to the main chimney, through which the supply pipe T is led for the oxidizing air in order to preheat same. The pipe terminates in an opening at one end of the furnace, entering just above the cupel; while at the opposite end is the charging and inspection opening P, normally closed by a door or block. Over this opening is arranged a hood Q terminating in a pipe connected to the main flue for carrying off fumes.

When the furnace is in operation, the burners H fire across the combustion chamber G on to the arch J, and the products of combustion and oxidation are carried off through the flues K, up one side of the furnace, across the top flues L, and down the other side flues M, passing thence through the longitudinal flues N to the chimney.

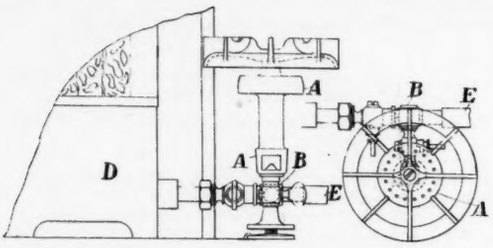
Auxiliary Burners for Gas-Fires.

FLETCHER, RUSSELL, AND CO., LIMITED, and BANKS, W., of Warrington.

No. 23,963; Dec. 12, 1914.

This auxiliary burner for a gas-fire (for heating a kettle) is so arranged that, instead of being connected to, or supported by, the frame of the gas-fire, it is connected-up between the gas connection of the fire and of the gas supply pipe, and is supported from the floor by

a foot adjustable according to the height of the gas connection of the fire.



Banks' (Fletcher, Russell, and Co.) Auxiliary Burners for Gas-Fires.

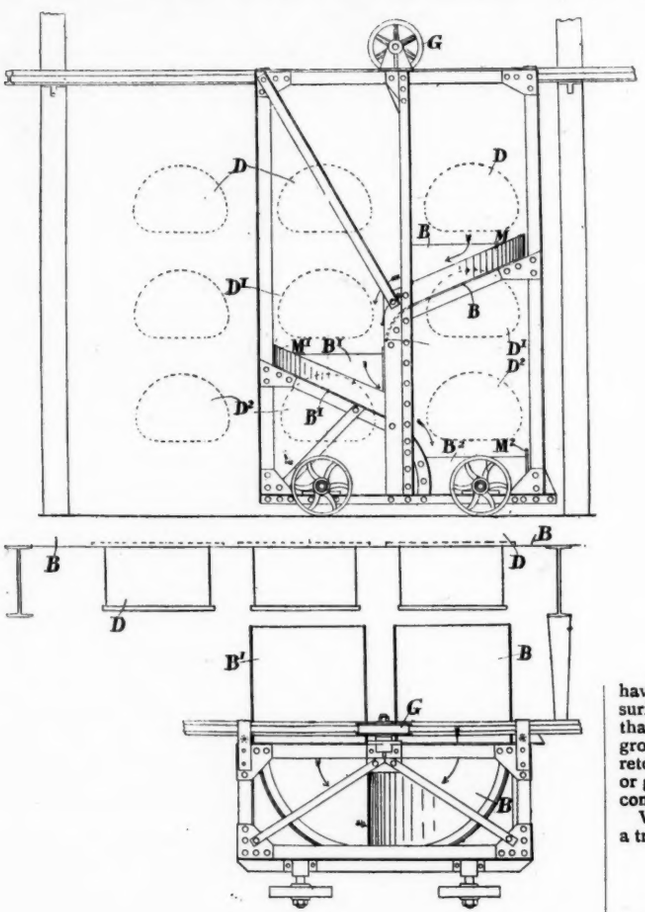
The auxiliary burner A is provided with a three-way connection B, the branches which are connected to the fire D, the supply pipe E, and the branch leading to the burner. The base of the burner is provided with an adjustable foot. In fitting the auxiliary burner to an existing fire it is only necessary to disconnect the supply pipe, fit the connection B, and couple-up the branches, after making the necessary adjustment of the foot, which has a screw-threaded stem.

Discharging Retorts.

DRAKES LIMITED, of Ovenden, Halifax, and WALKER, A., of Wallsend-on-Tyne.

No. 8438; April 3, 1914.

The object of this invention is to provide means for receiving the spent coke as it is being discharged from retorts, so that in descending it is received on an inclined guiding surface which gradually conducts it to a travelling conveyor—the inclined guiding surfaces permitting a comparatively gradual descent of the coke in order to prevent it being broken. The apparatus is "so constructed as to occupy comparatively little space in front or behind the retorts and yet secure that gradual step-by-step inclination from the highest series of retorts to the ground which is necessary for preventing the coke from being broken."

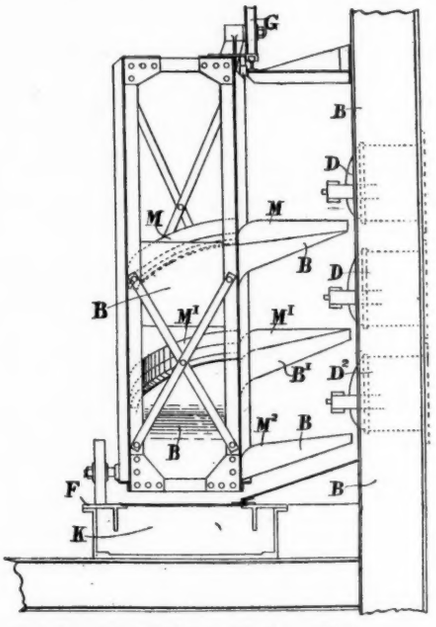


The illustrations comprise a side elevation of the apparatus in proximity to the discharge orifices of a series of retorts, an elevation of the apparatus, and a plan of parts of the machine.

A framework is provided to form a vehicle upon which are mounted inclined guiding surfaces B, B^1, B^2, so that one part may have one set of inclines mounted within it, leading in one direction, while the other part has another set of inclines, which lead in the opposite direction. These guiding surfaces have their respective vertical guiding flanges M, M^1, M^2. The framework is supported by wheels near its base, and preferably on that side only which is farthest away from the structure in which are the retorts D, D^1, D^2. These wheels travel on the floor or over rails F nearly level with the floor; while on the opposite side and at the upper part of the framework another and central wheel G (which preferably has a grooved periphery to take over a guiding and supporting rail) is mounted, so that the runners on one side of the apparatus and the runner G on the upper part form supports, as well as means for facilitating the moving of the whole plant along the front of the series of retorts. Fixed upon the framework in such manner as to extend laterally from it, are the plates B, B^1, B^2, which are at an inclination to the horizontal plane and which occupy positions relatively with the respective series of retorts.

The inclined surfaces (formed of sheet metal) correspond in number with the number of retorts that are situated in one and the same vertical plane, although the inclines are in the vertical planes that two tiers of retorts occupy. Each incline has its upper edge near the mouth of its respective retort; and from this edge the inclined part extends in alignment with its retort until the first part of the framework is reached. The inclined part of the inclines B B^1 is then made to follow a curved path within the framework, and finally end with its edge in the position illustrated. Thus the coke discharged from the retort first travels in a descending path in alignment with the retort whence it has been discharged, until it reaches the interior of the framework, and then it is deflected and caused to travel in a still descending direction, but now at right angles to its former course. In continuing its descent (provided it commenced with the incline B) it would be conducted from it to descend on to the curved part of the incline B^1, and from this down to the place where it had to be deposited—in its course having followed a zig-zag path somewhat as shown by the arrows, "in no part of which would it have descended or fallen through such a distance as to cause any undesirable breakage."

Now, taking the lowest retorts D^2, Each of these has its contents discharged on to the lowest guiding surface B^2 extending from the framework; the next higher series of retorts D^1 have their contents discharged on to the extending part of the guiding-plate B^1, over which they travel first towards the framework then laterally within the framework to finally descend as described. The third series of retorts D have their contents discharged on to an extended part of the guiding surface B, which conducts the coke in the direction of the arrows, so that it will fall on to the guiding surface B^1 and from there to the ground or floor below. Thus the contents discharged from the highest retorts are gradually conveyed to the ground in such successive stages or gradations as will enable them there to be delivered in the desired condition.



Drakes and Walker's Coke-Discharge Plant.

When the coke is discharged into the cavity K it is received by a travelling carrier so that it may be deposited where desired.

Valves for the Control of Gas-Purifiers.

SADLER, H. S., and EDWARD COCKEY AND SONS, LIMITED, of Frome.

No. 8898; April 8, 1914.

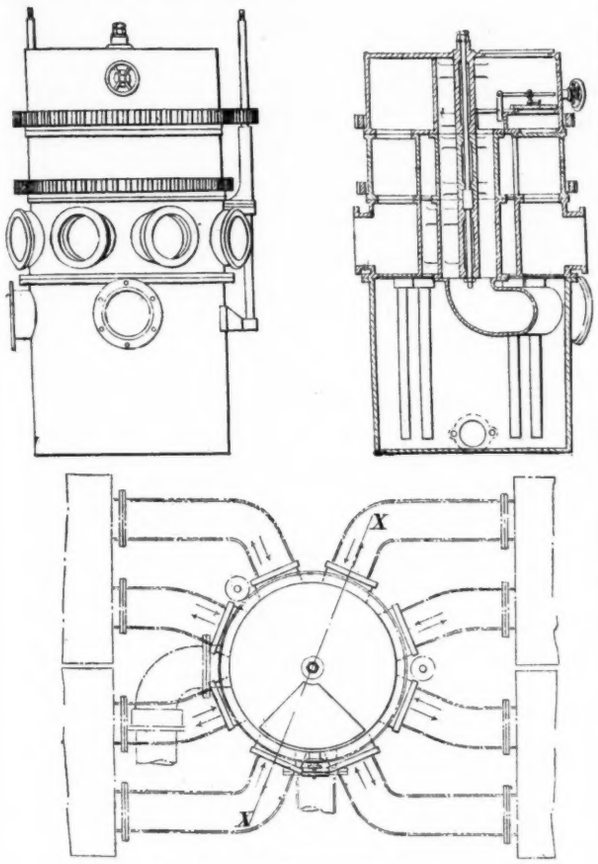
This invention has for its object to provide in a self-contained apparatus means whereby the gas may be made to pass to the various purifiers in any desired sequence or cycle, either backwards or forwards; and it is described in the specification as applied more particularly to the control of gas when it is to be passed to a number of ordinary purifiers.

When so used as a centre valve, by preference one central vessel forms as it were the base or drainage chamber—in circular form for convenience of construction and having two branches, one for the

main inlet, the other the main outlet. The lower part of the chamber forms a well or collector for the deposit of tar, sludge, or the like. This lower base chamber is made as a fixture and a second chamber is so arranged that a number of separate compartments are formed in it, suitable for connecting the inlet and outlet by way of branches to a number of independent vessels, so that either of the separate compartments can be used as inlet or outlet to the vessel under control.

This chamber is provided with two inner annular passages or spaces; the inner or central one forming part of the outlet conduit, while the outer one forms part of the inlet conduit. Above this second chamber is arranged a third chamber, and means are provided whereby it may be rotated—subdividing the chamber also into compartments to agree with, and pair with, the divisions in the lower chamber compartments, except only that the middle gas space is made to be closed on the top, and also one of the outer openings to be similarly closed. The closed gas space of the outer opening communicates with the annular space in the lower ring, for, in turn, making a free passage from the main inlet branch to the base chamber.

When the third chamber is rotated, the outer sealed compartment is superimposed over any one of the lower corresponding ports or openings, thereby directing the flow into the desired inlet to the purifiers that are to be under control.



Sadler's (Cockey and Sons) Centre-Valve Arrangement.

The illustration shows an elevation of the control valve referred to, a plan in which the purifiers and inlet and outlet connections to the valve are indicated diagrammatically, and a sectional elevation of the valve on the line X of the plan.

An upper chamber is arranged immediately above the three chambers before described, which upper chamber can be rotated by suitable means, and openings are provided therein to correspond with those formed below, including the sealed or closed chamber. One central opening communicates with two outer openings made to be under control by means of any ordinary regulating valves or by a duplex arrangement of valves, so that either of the openings can be put into communication with the central outlet opening, thereby causing the main outlet opening to be connected to either of the branches running to or from either of the purifiers.

The rotation of the upper chamber and the arrangement of independent control valves, as described, permits the gas to find an exit through either of the valves, and thus to be placed in free communication with the central opening or main outlet for the purpose of causing the gas from any one of the purifiers to come readily from that vessel, through either pipe, to the outlet for the purpose of making the gas pass either upwards or downwards, and by any sequence of operations through the different purifiers.

Should it be necessary to alter the arrangement of purifiers, or cause the gas to pass from one purifier by means of a bye-pass direct to another before going to the main outlet, independent and separate control valves are provided in the central casing, or valves may be inserted in the openings corresponding to the vessel it is desired to bye-pass—the valves being fitted in the top rotating chamber only. Alternatively an independent valve may be arranged in the branches running from the separate purifiers for shutting off or diverting the gas when necessary for any particular purpose.

PARLIAMENTARY INTELLIGENCE.

HOUSE OF LORDS.

The following further progress has been made with Bills:—

Bill brought from the Commons, read the first time, and referred to the Examiners: Bury and District Joint Water Board.

Bills read a second time and committed: Ammanford District Council, Ascot District Gas and Electricity, Doncaster Corporation.

Bills reported, with amendments: South Staffordshire Water, West Gloucestershire Water.

Bills read the third time and passed: Altrincham Gas, Northwich Gas, Sutton Water.

The Carmarthenshire County Council have petitioned against the Ammanford District Council Bill.

HOUSE OF COMMONS.

The following further progress has been made with Bills:—

Bills brought from the Lords, read the first time, and referred to the Examiners: Altrincham Gas, Northwich Gas, Sutton Water.

Bills reported, with amendments: Ilfracombe Gas, Lurgan District Council.

Bill read the third time and passed: Bury and District Joint Water Board.

Two Gas and Water Provisional Order Confirmation Bills have been introduced, read the first time, and referred to the Examiners. One (No. 2) relates to Guildford Gas, Melton Mowbray Gas, Swanage Gas, and Hoylake and West Kirby Gas and Water; and the other (No. 3) to Cheadle Gas, Heathfield and Waldron Gas, Liverpool Gas, Mid Kent Gas Light and Coke, Rothwell Gas, and Fisherton Anger and Bemerton Water.

REDEEMABLE STOCK OF STATUTORY COMPANIES.

A Bill has been brought in by the President of the Board of Trade (Mr. Runciman) to enable certain statutory companies to issue redeemable preference or debenture stock. At present these companies can only issue stock on war terms; and in most cases they will have no power (apart from those conferred by the Bill) to redeem any stock so issued when normal conditions again prevail. The following are the principal features of the Bill, which was read a second time last Thursday, and referred to a Committee of the Whole House.

It is provided that where a statutory company, as defined by the intended Act, are authorized to raise any preference or debenture stock, they may create and issue it so as to be redeemable on such terms and conditions as may be specified in a resolution of the company passed at a special meeting convened for the purpose.

If it is so provided in the resolution, the statutory company may (*a*) call in and pay off the stock, or part thereof, at any time before the fixed date of redemption, and (*b*) redeem the stock, or part of it, either by paying off the stock or by issuing to any stockholder, subject to his consent, other stock in substitution therefor. The company may, for the purpose of providing money for paying off the stock or of providing substituted stock, create and issue new stock (either redeemable or irredeemable) or reissue stock originally created and issued, provided that the creation and issue for the purpose of any particular class of stock does not make the total nominal amount issued exceed the amount of the class of stock which the company are for the time being authorized to create.

The company may set aside out of revenue, after providing for the payment of interest on any loan, or on any guaranteed, preference, or debenture stock of the company, and for other fixed charges and obligations, such sums as they may consider proper for the purpose of forming a fund for the redemption at maturity of any redeemable preference or debenture stock which, under the conditions of the creation and issue of that stock, is to be redeemed wholly or partly in cash; and the company may invest such sums, and the income arising therefrom, in trustee stocks or other securities. Any sums so set apart are to be applied for the redemption at maturity of any redeemable preference or debenture stock for the redemption of which they have been set apart, but may, if the directors think fit, be applied in the purchase of any such stock at a price not exceeding the redemption price.

A resolution of a statutory company, passed before the commencement of the Act and after the outbreak of the war, for the creation or issue of redeemable stock is to have the same effect as if the Act had been in operation at the time the resolution was passed.

The Act is to apply only to stock authorized to be created or to be issued before the outbreak of the war, or afterwards, but before the commencement of the Act; and redeemable stock is not to be created or issued in pursuance of the powers given by the Act during the continuance of the war and a period of twelve months thereafter, except with the consent of the Treasury.

The interpretation clause sets forth that the words "statutory company" mean a company incorporated by Special Act, who are authorized to construct, work, own, or carry on any public undertaking; and the powers given by the Act are to be deemed to be in addition to, and not in derogation of, any others given by any other Act.

The Directors of the Monte Video Gas Company, Limited, recommend the payment, on June 1, of a final dividend of 1½ per cent.; making a total of 3 per cent. for the year 1914, as compared with 4 per cent. for the previous year,

PLYMOUTH CORPORATION BILL.

The gas portion of this Bill was last Wednesday dealt with by a Committee of the House of Lords presided over by Lord NEWTON.

Mr. HONORATUS LLOYD, K.C., who with Mr. TYLDESLEY JONES appeared for the Corporation, said this was a Consolidation Bill consequent upon the amalgamation of Plymouth, Devonport, and East Stonehouse last year. Part III. consolidated the various powers possessed by the three authorities as regards gas supply; but there was opposition to clause 46. The old Borough of Devonport, now part of the enlarged county borough of Plymouth, were owners of a gas undertaking, and clause 46 of the present Bill was substantially a re-enactment of clause 30 of the Devonport Corporation Act of 1901. The latter clause was the model clause at the time it was granted, and gave the Corporation powers directly to fit houses for gas and deal in and hire various apparatus. It was asked by the Corporation that the same power should be passed on to the new Plymouth Corporation, but only as far as the old Devonport gas limits were concerned. It was not asked that it should apply to the Plymouth and Stonehouse gas limits, where the gas supply had hitherto been furnished by a company. A small drafting amendment to the clause as it originally existed had been made; and he did not think that any question could arise on that. The Devonport Corporation had found the clause extremely useful, as it had enabled the development of the gas undertaking in a manner which would otherwise have been impossible. Before the Corporation exercised these powers extravagant terms were demanded of the consumers for the installation of gas, and this had had the effect of retarding the development of the gas undertaking. The Corporation, under the clause, had been able to fit working-class houses at a very small cost; and no less a sum than £70,000 had been spent upon slot meters, cookers, &c. The opposition to the transfer of the existing clause to the Consolidated Bill was by the Plymouth Mercantile Association, who were represented by Mr. Jeeves, who complained that the Corporation should not be allowed to do this work in competition with the local traders. The bone of contention seemed to be that whereas the clause as it existed in the Devonport Corporation Act of 1901 was then the model one, a few years ago a new form of Model Clause was introduced which provided that a local authority should not itself do the work, but should carry it out through contractors. The point was whether the Committee, in considering a Consolidation Bill, should vary the powers already possessed by a local authority. There was a very strong feeling among the people of Devonport that the clause should be retained, as it had undoubtedly been very much to the benefit of the consumers. On the other hand, the Plymouth Mercantile Association desired to have the contractor interposed between the Corporation and the consumer. The question of Consolidation Bills had been considered a good deal in recent years; and the Local Legislation Committee, in the other House, had on more than one occasion reported upon the importance of local authorities bringing up Consolidation Bills, and so getting rid of the inconvenience arising from having local legislation spread over many Acts. If, however, it was to be understood that local authorities, when they came with Consolidation Bills, were to be deprived of existing powers, they would be rather loth to promote such measures. If the Committee would be inclined in ordinary circumstances to adopt the Model Clause, he would ask them not to do so in this case, because the existing clause had been found of great benefit. Furthermore, it was curious that it was the Plymouth Association who were opposing, whereas the Devonport Mercantile Association, which was a separate body, did not. As he had already said, it was not proposed to apply the clause to Plymouth. If the Committee thought the clause would be a bad precedent to go into a Consolidation Bill, but was nevertheless in favour of the Corporation retaining the existing powers, that technical difficulty could be overcome by adding the section of the Act of 1901 in question in the schedule to the Bill as one that was to remain in force. It would be a mere matter of form, and the result would be the same.

Mr. *J. H. Ellis*, the Town Clerk to the Plymouth Corporation, said the clause was solely for the benefit of the working classes. Before the old Devonport Corporation exercised the powers, there was difficulty in getting gas introduced into workmen's houses. Deputations had been sent to the Corporation in favour of retaining the clause in the present Bill; and he was sure that the Borough Funds meeting would not have sanctioned the measure had it been proposed to drop the powers. The effect of it so far had been to reduce the cost of one of the commodities of life for cooking, lighting, and heating; and not a voice in Devonport had been raised against keeping the powers.

Mr. JEEVES, in his cross-examination, put it that up to two years ago the Devonport Corporation exercised the powers under the clause through a contractor. Witness agreed, but said it had been found extraordinarily expensive. The cost of maintaining the prepayment installations through a contractor was 4s. 8d. per annum; whereas the Corporation did it for 6d. Devonport was not in a good position for making a contract for the work; the contractor in question came from Exeter.

Mr. HONORATUS LLOYD remarked that therefore, by taking over the work, the Corporation did not inflict any hardship on Plymouth or Devonport contractors.

Alderman *W. Littleton*, an ex-Mayor of Devonport, also strongly supported the clause, and spoke as to the benefit it had been. A Special Committee had been formed to inquire into the old contract for carrying out the terms of the clause; and it was found to be a very unfavourable one for Devonport. The saving since the Corporation took over the work amounted to £2500 per annum in the maintenance of the prepayment installations, with the result that the price of gas had been reduced from 2s. 8d. to 2s. 4d. per 1000 cubic feet. There were some 12,000 installations in Devonport.

In cross-examination, witness said he knew a Mr. W. Truscott, a Devonport fitter, but had never heard him say he had suffered by reason of what the Corporation did in this respect. As to the contract with the Exeter firm, Counsel put it that it was not fair to compare a price entered into many years ago with what could be done to-day. Witness replied, however, that when the inquiry into the terms of the contract was held two years ago, the contractor did not say it was a high price. Indeed, he wanted to continue making the same charge, and contended it was a fair price. Notwithstanding the increase in labour and materials in recent years, the Corporation could afford to do for 6d. what the contractor charged 4s. 8d. for.

In course of further questions, Mr. Jeeves indicated that he was also, at a later stage, opposing a clause in the Bill giving electric wiring and fitting powers over the whole of the new Plymouth area. Witness said Devonport already had the powers, and he believed it would be good for Plymouth also to have them.

Mr. JEEVES, addressing the Committee, said he was unfortunate in that his one witness, the gas-fitter from Devonport, was not present, having been under the impression that the Bill would not be reached so soon as it was. This witness would have told the Committee how much he had suffered from the direct trading of the Devonport Corporation in this matter. The Model Bill clause, compelling local authorities to work through a contractor, had been in operation for a number of years in a form which had been evolved after considerable controversy, between the gas-fitting trade on the one hand and local authorities on the other. Finally, it had been determined that it was not desirable that a local authority should enter into competition with its own ratepayers with regard to such matters as gas and electric fittings. Consequently, the present Model Clause provided that the gas or electric undertaker should not do any work except between the main and the consumer's meter; all the remainder of the installation being carried out through a contractor. He submitted that while the Bill was said to be a Consolidation Bill, it was a Consolidation Bill under very peculiar circumstances. An ordinary Consolidation Bill applied to the Acts relating to one particular area, but this applied to three areas; while the clause in question only related to a portion of the amalgamated area. Now, therefore, was the time for the Committee to say they would insist upon the Model Clause for the whole of the area. If the Committee were not with him in granting what he asked, he would then suggest that sub-clause 3 of clause 46 be struck out.

The attention of the Committee having been called to a report on this clause by the Home Office, who pointed out how it differed from the Model Bill,

The CHAIRMAN announced that the Committee would allow the clause in the Bill to stand:

> (1) The Corporation may sell, let for hire, or otherwise deal in, fix, repair, and remove (but shall not manufacture) engines, stoves, ranges, pipes, and other fittings (all of which are in this part of this Act called "fittings"), for lighting, for motive power, for the warming and ventilation of houses and buildings, for the cooking of food, and for all other purposes for which gas can or may be used, and may provide all materials and do all work necessary or proper in that behalf, and with respect thereto may demand and take such remuneration or rents and charges, and make such terms and conditions, as may be agreed upon between the Corporation and the person to or for whom the fittings are sold, let, fixed, repaired, or removed.
>
> (2) Any fittings let for hire under the provisions of this section shall not be subject to distress or to the landlord's remedy for rent, or be liable to be taken in execution under any process of any Court or any proceedings in bankruptcy against the persons in whose possession the same may be.
>
> (3) All fittings let for hire under the provisions of this section shall, notwithstanding that they be fixed or fastened to any part of any premises in which they may be situate, or to the soil under any such premises, at all times continue to be the property of, and removable by, the Corporation: Provided that nothing in this subsection shall affect the amount of the assessment for rating of any premises upon which any such fittings are or shall be fixed.
>
> (4) The Corporation shall only be entitled to the privileges and exemptions conferred by sub-sections (2) and (3) of this section in respect of such of the said fittings as shall have upon them respectively a distinguishing metal plate affixed to a conspicuous part thereof, or a distinguishing brand or other mark conspicuously impressed or made thereon sufficiently indicating the Corporation as the actual owners thereof.

The question of the electrical contractors was next dealt with. In this case, the Devonport Corporation had powers to wire and fit premises without the intervention of a contractor, and the old Plymouth Corporation did not. The Bill asked for the extension of these powers to the whole of the new borough; and the Committee again agreed. In the case of gas, of course, the clause only relates to the old Devonport Corporation limits.

LINCOLN CORPORATION BILL.

The gas clauses of this Bill were last Thursday dealt with by the Local Legislation Committee of the House of Commons presided over by Mr. MIDDLEBROOK.

Mr. FORBES LANKESTER, K.C., and Mr. JEEVES appeared for the promoters. There was no opposition.

It is proposed to extend the limits of supply to include the parishes of Bracebridge Heath, North Hykeham, and Waddington, and the other clauses deal with the laying of ancillary pipes, anti-fluctuators on gas-engines, period of defective error in meters, and power to refuse to supply persons in debt for other purposes. The latter power was contained in clause 56; but the Home Office reported against it, on the ground that it gave the Corporation the right to refuse to give a supply of gas or electricity to any person who had not paid all the charges for gas, electricity, or water due from him in respect of other premises which he occupied or had occupied.

Mr. FORBES LANKESTER, in reply to the Committee, said that, while it was proposed to cut off the gas or electricity if the water-rate had not been paid, it was not proposed to deprive the occupier of his water supply if the electricity or gas charges were not paid.

It was pointed out by the Home Office representative that the Corporation have the ordinary powers for recovering the water-rate.

Mr. FORBES LANKESTER: That is so, but we want this as well.

The Committee refused to sanction the clause.

The other gas clauses were passed.

On the consideration of the electric clauses, the Committee refused to sanction a clause giving power to the Corporation to lay mains in streets not dedicated to public use under the same provisions as public streets; and the promoters at once agreed to insert words providing that it should only be on the application of the owner or occupier of premises in such private road.

The clause was passed in this amended form.

Clause 62 (powers to supply electrical fittings) had been deleted by the Corporation, who brought up a new clause agreed with the Electrical Contractors' Association. This new clause differed from the Model Clause, and empowered the Corporation to sell fittings to a consumer after they had been on hire for three years. At present, hired apparatus could not be sold. It also provided that if, as the result of a visit to the Corporation show-room, a sale of fittings was effected through a contractor, 25 per cent. of the discount received by the contractor was to be paid to the Corporation as profit.

Mr. PRITCHARD (Parliamentary Agent), who admitted that the clause differed widely from the Model Clause, said that experience had shown that local authorities were hampered at every turn by the Model Clause.

The Committee decided that the Corporation must take the Model Clause.

ILFRACOMBE GAS BILL.

This Bill was sent forward last Wednesday for third reading by the Unopposed Bills Committee of the House of Commons. It has already passed the House of Lords [see "JOURNAL," March 16, p. 679)] and the facts are as then stated. It is the first Bill to come before the Unopposed Bills Committee of the House of Commons with a 500 B.Th U. calorific test, without a margin before penalties occur.

METROPOLITAN WATER BOARD BILL.

A Committee of the House of Commons of which Sir WILLIAM HOWELL DAVIES is Chairman recently disposed of this Bill. It authorizes the Board to construct six new service reservoirs, eight new aqueducts, together with a well and pumping station, and sanctions £1,000,000 new borrowing powers. There was only slight opposition from the London and Surrey County Councils; the former asking for certain surplus lands to be utilized free of charge for street widenings at Eltham, while the latter sought special protection with regard to their roads in respect of the aqueduct from the new pumping-station near Farningham, which is to connect-up with the Honor Oak and Nunhead reservoirs. The promoters, however, argued that the provisions of the Water-Works Clauses Act were sufficient protection for the County Council; and eventually the Committee passed the preamble of the Bill.

WOLVERHAMPTON WATER BILL.

Protection for Gas Company's Mains.

On the consideration of clauses in this Bill, which was last Tuesday before a Committee of the House of Lords presided over by the DUKE OF WELLINGTON, a clause was submitted on behalf of the Wolverhampton Gas Company for the protection of their mains.

Mr. LEWIS COWARD, K.C., for the Gas Company, asked the Committee to look at clause 20, which was to the following effect:

> The provisions of sections 176 to 183 of the Act of 1869, relating to the breaking-up of streets, shall apply, with the necessary modifications, to the construction, laying down, erection, and maintenance in any street or road, whether within or without the limits within which the Corporation are empowered to supply water, of the aqueducts authorized by this Act, and of any discharge pipes, telephone, or telegraph posts, wires, conductors, or apparatus erected or laid down by the Corporation for the purpose of their water undertaking.

On behalf of the Gas Company, Counsel submitted that the sections referred to did not give sufficient protection to-day, nor did they give the protection which Parliament now invariably gave to such undertakers as gas companies or owners of hydraulic, electric, or similar mains. The clause provided for "the necessary modifications" to make them adaptable to the existing condition of things. But when the Gas Company as long ago as January approached the Corporation with a view to discussing the matter, they were informed that an interview would be of no use at all, and the Corporation had not pointed out in any way any modifications of the existing provisions. He contended that the provisions which were considered sufficient in 1869 were not enough to-day. At present, the Corporation, unless they were actually going to move a gas-main, could carry out any work they pleased over, under, across, or in close proximity to, the gas-mains without giving the Gas Company any notification whatever of what they were doing. Consequently, he asked the Committee to grant him the protection which had been given over and over again to gas undertakers. A clause which he would submit followed the Southend Act of 1909 and the Merthyr Tydfil Act of 1911. It was also in the Acts of the Metropolitan Water Board for 1911 and 1912, and had been voluntarily inserted in the Board's Bill this session. His proposed clause would substitute clause 20.

Mr. JEEVES said it could not substitute clause 20, as it related to other people besides the Gas Company. Any clause dealing with the gas-mains must be a special one relating only to the Company.

Mr. COWARD said that under the Corporation Bill a large aqueduct was to be made; but the Act of 1869 never contemplated anything of this kind. His proposed clause was in the following terms:

> The following provisions for the protection of the Wolverhampton Gas Company (in this section referred to as "The Company") shall, unless otherwise agreed between the Corporation and the Company, apply and have effect—that is to say:
>
> (1) Before commencing any of the works by this Act authorized in or under any street or road, in or under which any mains, pipes, or other works (hereinafter called "apparatus") of the Company are situate, the Corporation shall deliver to the Company plans, sections, and descriptions of all works so proposed to be executed, describing the proposed manner of executing the same, and such plans, sections, and descriptions shall be delivered to the Company at least twenty-one days before the commencement of any such work.
>
> If it should appear to the Company that such works will interfere with, or endanger, any of their apparatus, or impede the supply of gas by means of such apparatus, the Company may give notice to the Corporation to lower or otherwise alter the position of such apparatus, or to support the same, or to substitute temporarily or otherwise other apparatus in such manner as may be considered necessary, and to lay or place under any apparatus cement, concrete, or other like substance, and any difference as to the necessity of such lowering, alteration, support, substitution, or laying or placing cement concrete or other like substance (hereinafter called "protective works") shall be settled as hereinafter provided; such works of the Corporation (so far as the same are intended to be constructed underground) to be constructed so that not less than 3 feet shall anywhere be left between the crown of the said works and the road surface.* All such protective works shall, save as hereinafter provided, be done and executed by, and at the expense of, the Corporation, but to the satisfaction and under the superintendence of the engineer of the Company, and the reasonable costs, charges, and expenses of such superintendence shall be paid by the Corporation. If the Company, by notice in writing to the Corporation within fourteen days after the receipt by them of notice of the intended commencement by the Corporation of any such works of the Corporation, so require, the Company may, by their own engineer or workmen, do and execute protective works so far as they effect the apparatus of the Company, and the Corporation shall, on the completion thereof, pay to the Company the reasonable expenses incurred by them in the execution of such protective works.
>
> (2) In the event of the plans, sections, and descriptions so delivered to the Company as aforesaid not being objected to within fourteen days from such delivery, the works shown and described thereon shall be executed in strict accordance therewith.
>
> (3) The Company may, if they deem fit, employ watchmen or inspectors to watch and inspect the works whereby any of their apparatus will be interfered with or affected during the construction, repair, or renewal of such works, and the reasonable wages of such watchmen or inspectors shall be borne by the Corporation and be paid by them to the Company.
>
> (4) If any interruption in the supply of gas by means of any apparatus shall without the written authority of the Company be in any way occasioned, either by reason of the exercise of the statutory powers conferred upon the Corporation or by the act or default of the Corporation, or of any of their contractors, agents, workmen, or servants, or any person in the employ of them, or any or either of them, the Corporation shall forfeit and pay to the Company for their use and benefit a sum not exceeding £10 for every day during which such interruption shall continue.
>
> (5) The expense of all repairs or renewals of any apparatus of the Company, or any works in connection therewith which may be rendered necessary, either by reason of the exercise of the statutory powers conferred upon the Corporation or by the acts or defaults of the Corporation, their contractors, agents, workmen, or servants, or any person in the employ of them, or any or either of them, or rendered necessary by reason of any subsidence resulting from the works of the Corporation, whether during the construction of such works or within twelve months of the completion thereof, shall be borne and paid by the Corporation.
>
> (6) It shall be lawful for the Company and the engineers, workmen, and others in their employ, at all times when it may be necessary, to enter upon the lands, works, and premises of the Corporation at any point or place where the apparatus of the Company exists, and to do all such works in and upon such lands and premises as may be necessary for repairing, maintaining, or removing, or replacing, or extending such apparatus under or over the same lands and premises. Provided always that in so doing the Company, their engineers, or workmen, or others in their employ, shall not interrupt the user of any of the works of the Corporation by this Act authorized. Provided also that the Company shall make good and reimburse to the Corporation all damage to such works occasioned by the exercise of the powers by this section reserved to the Company.
>
> The seventh section of the clause provides for arbitration.

Mr. *Percy G. Winstanley*, the Engineer to the Wolverhampton Gas Company, said the Company had not been served with any plans of the proposed aqueduct. He understood from the Bill, however, that it was to be constructed through Tettenhall, Wrottesley, Godsall, and Oaken, along the public roads in which the gas-mains were laid, and which were already very crowded. The plans which had been deposited with one of the Rural District Councils showed that for the greater part of the way the aqueduct would be in close proximity to the gas-mains, and in many places on the same side of the road. Under the Act of 1869, if the Corporation desired to remove or alter the position of any gas-main, the Gas Company had three days' notice, with plans, sections, and descriptions; but unless pipes were actually taken up and removed, no notice was given. The result was that the Corporation might undertake work which would be well in hand before the Company were aware of what was being done, and pipes

* The passage referring to the 3-feet depth was struck out by the Committee.

might be seriously injured—*i.e.*, the foundations might be cut away, or something of the kind happen. He felt the Company were entitled to up-to-date legislation in regard to this matter.

Mr. JEEVES, in his cross-examination, first put it that the reason why the Corporation Engineer would not meet the Gas Company's Engineer was because the Company insisted upon the interview being in the presence of their solicitor.

Witness denied this.

In answer to further questions, witness said he had been Engineer to the Company for 17 years, and agreed that he had never had any trouble with the Corporation in regard to his mains. If there had been any damage or interference, it had always been repaired and put right at the expense of the Corporation. The new aqueduct, however, was to be laid for a considerable portion of its length along rural roads; and the difficulties, owing to the narrowness and congestion from existing pipes, were likely to be greater. The Company had mains from 12 to 4 inches in diameter, and the supply in some cases depended upon a 4-inch main; so that any interference with the pipe would mean total interruption of the supply.

Mr. JEEVES remarked that all the local authorities were satisfied with clause 20 in the Bill.

Mr. COWARD pointed out that, since the Bill was deposited, special clauses for the protection of the local authorities had been inserted.

Mr. JEEVES, in dealing with the proposed clause, asked what right had the Gas Company to say that the water-main should be at least 3 feet from the surface of the road.

Witness said he was indifferent on this point so long as he knew what the Corporation were going to do, and was protected against damage. It was true that there had been no trouble hitherto; but anything which the Corporation had done was purely voluntary, and the Company had no right to insist upon it.

Mr. JEEVES asked the Committee not to alter the existing state of affairs, which, on the witness's own evidence, had worked perfectly satisfactorily. The attempt was being made to put Wolverhampton under the same terms as London; but there was an extraordinary difference between the two places. As a matter of fact, the Corporation, under the Act of 1869, had powers to lay the new aqueduct so far as the portion inside the existing limits of supply was concerned. Had they chosen to ask Parliament for power only to lay the portion outside between the new pumping-station and the boundary of the existing limits, the Gas Company would have been bound by the provisions of the Act of 1869 so far as the greater part of the length of the aqueduct was concerned. This, however, would have meant applying to the Local Government Board for a loan for the portion within the existing limits, and it was felt better to bring the complete scheme before Parliament.

The COMMITTEE decided to grant the clause without the words providing that the depth of the Corporation's new aqueduct should be at least 3 feet from the surface of the road, in the second paragraph of sub-section 1.

GAS AND WATER PROVISIONAL ORDERS FOR 1914.

Report by the Board of Trade.

The Board of Trade last week issued a report on their proceedings under the Gas and Water Works Facilities Act, 1870, during the past session. It shows that in December, 1913, seventeen applications were made for Provisional Orders—thirteen relating to gas, one to gas and water, and four to water undertakings. The amount of capital proposed to be authorized was £441,500 by shares and £158,621 by loan—£389,000 share and £136,739 loan capital being for gas and £52,500 share and £21,882 loan capital for water purposes. The Gas Orders related to Balcombe, Calvert (Charndon), Dronfield, Dursley, East Kent, Garstang, Harpenden and District, Hayfield, High Wycombe, North Middlesex, St. Ives (Hunts.), Swansea, Uxbridge; the Gas and Water Order, to Flint; the Water Orders, to Amersham, Beaconsfield and District, Elham Valley, Fisherton Anger and Bemerton.

The principal objects of the applications were as follows:

Balcombe Petrol Gas.—To empower the Balcombe Gas Company, Limited, to construct and maintain works for the manufacture and storage of petrol gas, and to supply this gas in part of the parish of Balcombe, in Sussex.

Calvert (Charndon) Gas.—To empower the City Oil Syndicate, Limited, to bore for and produce natural gas, to construct and maintain works for treating, preparing, and storing it, and to supply it within parts of the parishes of Twyford and Charndon, in Buckinghamshire.

Dronfield Gas.—To empower the Dronfield Gas Company to construct and maintain additional gas-works and acquire more lands.

Dursley Gas.—To empower the Dursley Gas Company, Limited, to raise more capital and to construct and maintain additional gas-works.

East Kent Gas.—To authorize John Francis Kelley and Cornelius Brittiffe Tully to construct and maintain works for the manufacture and storage of gas, and to supply gas within the parishes and places of Lyminge, Elham, Postling, Stanford, Eastry, Knowlton, Chillenden, Nonington, Barfreston, Tilmanstone, Eythorne, Betteshanger, Womenswold, Barham, Kingston, Bishopsbourne, Sibertswold, Lydden, Wootton, and Denton (otherwise Ashton), all in the eastern division of the county of Kent; also to provide for the testing of the calorific value of the gas supplied, and for other purposes.

Garstang Gas.—To extend the limits of supply of the Garstang Gas Company, Limited, and to empower the Company to raise further capital.

Harpenden District Gas.—To extend the limits of supply of the Harpenden District Gas Company, and to empower the Company to rase more capital.

Hayfield Gas.—To empower the Hayfield Gas Company, Limited, to construct and maintain additional gas-works, acquire lands, and raise further capital.

High Wycombe Gas.—To empower the High Wycombe Gas Company, Limited, to construct and maintain additional gas-works and to acquire lands.

North Middlesex Gas.—To empower the North Middlesex Gas Company to construct and maintain further gas-works and acquire more lands.

St. Ives (Hunts.) Gas.—To extend the limits of supply of the St. Ives (Hunts.) Gas Company, Limited, and to empower the Company to raise additional capital, maintain and continue certain existing gas-works, construct and maintain further works, and acquire additional lands.

Swansea Gas.—To authorize the Swansea Gas Company to construct and maintain further works for the manufacture and storage of gas, and to repeal the Swansea Gas Order, 1912.

Uxbridge Gas.—To empower the Uxbridge Gas Company to raise more capital and to acquire additional lands.

Flint Gas and Water.—To empower the Flint Gas and Water Company, Limited, to raise further gas and water capital, construct additional water-works, acquire lands, and use for the purposes of their water undertaking any water received by them from the Halkyn District Mines Drainage Company; also to provide for establishing a capital redemption fund.

Amersham, Beaconsfield, and District Water.—To empower the Amersham, Beaconsfield, and District Water-Works Company, Limited, to construct additional water-works and to raise capital; also to sanction and confirm the construction of certain existing works.

Elham Valley Water.—To extend the limits of supply of the Elham Valley Water Company, Limited, and to empower the Company to raise additional capital, construct further water-works, and acquire more land.

Fisherton Anger and Bemerton Water.—To extend the limits of supply of the Fisherton Anger and Bemerton Water-Works Company.

Three of these applications—viz., those from Balcombe, Calvert, and East Kent—related to proposed new undertakings. The remainder were in respect of those already authorized by Special Acts or Provisional Orders.

Opposition.

No objections were lodged against the Dursley, Hayfield, and High Wycombe applications, and that lodged against the Garstang application was subsequently withdrawn. The objections and representations made with regard to the other applications were duly considered by the Board.

In the case of Balcombe, several objections were lodged; but with the exception of that by the Haywards Heath District Gas Company they were subsequently withdrawn. This Company were promoting a Bill in Parliament to extend their authorized limits of supply so as to include, among other places, the parish of Balcombe. They therefore opposed the granting of powers to the Balcombe Company to supply petrol gas. After an inquiry lasting two days, the Board decided to grant the application of the Balcombe Company.

Several objections were lodged against the Calvert application; but they were afterwards withdrawn. The Board of Trade, after hearing the evidence of the promoters, were not satisfied that a case had been made for granting statutory powers, and they accordingly refused the application.

The application for the East Kent Order was made by the promoters of the Elham Valley Gas Order, 1912, who had allowed the powers conferred upon them by their Order to lapse. The limits of supply proposed in the Draft Order included, in addition to the area of supply authorized in the Elham Valley Order, sixteen other parishes in Kent. After hearing the promoters, the Board granted a Provisional Order re-enacting the provisions of the Order of 1912.

The promoters of the Fisherton Anger application failed to obtain the consent of the Bemerton Parish Council, and requested the Board to exercise their powers under section 4 of the Act and dispense with that consent. After holding an inquiry at their office, the Board decided to do this, and to grant the Order applied for, subject to certain amendments which appeared to be desirable. A special report was laid before Parliament in this case.

The Board granted a Provisional Order in the case of all the applications but that for Calvert.

Price of Gas.

A maximum price per 1000 cubic feet of gas was fixed in the following Provisional Orders: East Kent, 5s.; Flint, 5s.; Garstang, 6s.; and Hayfield, 4s. 3d. In the case of Balcombe, a maximum price of 3s. 9d. per 1000 cubic feet of petrol gas was fixed. A standard price of 4s. 6d., with a sliding-scale as to dividends, was fixed in the case of the St. Ives Order, with differential prices ranging from 7d. to 1s. 7d. outside the borough of St. Ives.

Illuminating Power.

An illuminating power of 14 candles was prescribed in the East Kent, Garstang, Harpenden District, and St. Ives Orders; and in each case the "Metropolitan" No. 2 burner was specified as the testing burner. The illuminating power previously prescribed in respect of the St. Ives undertaking was 15 candles.

Special Provisions.

The Balcombe Order grants power to the Balcombe Gas Company, Limited, to manufacture and supply petrol gas subject to any regulations which may be made by the Board of Trade. The Company are to comply with the provisions of the Petroleum Act, 1871, with regard to the storage of petrol. The petrol gas is to be supplied at a pressure of not less than 3 inches of water, and is to have an illuminating power of 35 candles when burnt in a mantle with a suitable burner. The Order also contains a clause reserving power to the Board of Trade to modify or suspend the powers of the undertakers in certain circumstances. In the Dursley Order, provisions were inserted with regard to the disposal of a part of the balance carried forward on June 30, 1913; and the undertakers were required, before June 30, 1917, to reduce this balance to a sum not exceeding one year's dividends. The

Hayfield Order contains a clause forbidding the undertakers to make up a deficient dividend after five years from the year in which it is paid. The Flint Order authorizes the undertakers to use for the purposes of their water undertaking water received by them from the Halkyn District Mines Drainage Company. The Order also contains a clause sanctioning the formation of a redemption fund, to be applied in paying off sums borrowed, and of a depreciation fund, to be applied in meeting expenses incurred in the replacement or removal of plant or works, or to any purposes of the water undertaking to which capital is applicable.

Confirmation Bills.

A Bill—the Gas Provisional Order (No. 1) Bill—was introduced in the House of Commons to confirm the Bagnalstown Gas Provisional Order which was granted by the Board of Trade in the session of 1913, but withdrawn from the Confirmation Bill to which it was scheduled. Bills to confirm the Provisional Orders made by the Board in the past session were introduced in the House of Commons as follows: Gas Provisional Order (No. 2) Bill, to confirm an Order relating to Balcombe Petrol Gas; Gas Provisional Orders (No. 3) Bill, to confirm Orders relating to East Kent Gas, Garstang Gas, Harpenden District Gas, St. Ives (Hunts) Gas, and Swansea Gas; Gas and Water Provisional Orders (No. 1) Bill, to confirm Orders relating to Dursley Gas, Hayfield Gas, High Wycombe Gas, Amersham, Beaconsfield, and District Water, and Elham Valley Water; and Gas and Water Provisional Orders (No. 2) Bill, to confirm Orders relating to Dronfield Gas, North Middlesex Gas, Uxbridge Gas, Flint Gas and Water, and Fisherton Anger and Bemerton Water-Works.

Opposition in Parliament.

No petition was lodged against the Gas Provisional Order (No. 1) Bill within the time allowed by the Standing Orders of the House of Commons; but the Carlow Rural District Council and the Carlow Board of Guardians sought permission to deposit a late petition. This was granted, and the Bill was considered by a Select Committee, who, after hearing the promoter of the Bagnalstown Order and the petitioners, decided that the Order ought not to be confirmed. Bill No. 2 was opposed by the Haywards Heath District Gas Company. The Select Committee to whom the Bill was referred reported that the Balcombe Order should be confirmed; but they inserted a provision to the effect that the powers granted by the Order should not prevent any company, body, or person from obtaining a Bill or Provisional Order authorizing the supply of coal gas in Balcombe. A petition was deposited in the House of Commons by the Alkali Manufacturers' Association against Bill No. 3, in respect of the Swansea Order. After hearing the parties, the Select Committee inserted in the Order a clause limiting the quantity of residual products which the undertakers may purchase from other gas undertakings, and forbidding them to manufacture chemicals from raw materials which are not genuine residual products of gas undertakings. A petition was deposited by the British Glanstoff Manufacturing Company, Limited, against the Gas and Water Provisional Orders (No. 2) Bill in respect of the Flint Order; but it was withdrawn.

Royal Assented.

The Gas and Water Provisional Orders (No 1) Bill and the Gas and Water Provisional Orders (No. 2) Bill received the Royal Assent on the 31st of July; and the Gas Provisional Order (No. 2) Bill and the Gas Provisional Orders (No. 3) Bill on the 7th of August.

LEGAL INTELLIGENCE.

BUTCHERS AND "DOMESTIC" WATER SUPPLIES.

Three sittings of the Brighton Magistrates have been occupied in hearing and giving judgment in a test case, against Arthur V. Barnes, a butcher, for using on his premises a domestic supply of water for other than domestic purposes. The summons, which was in two parts, concerned the payment of 19s. 6d. in respect of a sufficient and constant supply of water for domestic purposes; and, further, the sum of 6s. 6d. in respect of remuneration agreed on between the Corporation and the defendant for the supply of water for other than domestic purposes during the six months ended March 31, 1915.

Mr. R. HARKER appeared on behalf of the Corporation; and Mr. E. M. KONSTAM was for the defendant.

Mr. HARKER explained that the case had been brought simply with the idea of getting the magisterial decision as to whether defendant, as a user for domestic purposes within the meaning of the local Water Act, employed the water for other than domestic purposes. When the dispute arose, there was correspondence between the Town Clerk and Mr. Buckwell, who represented the Brighton and Hove Butchers' Association, of which the defendant was President; and Mr. Buckwell suggested that a test case should be brought, and put forward the name of Mr. Barnes, so that there should be a nominal defendant before the Bench. Mr. Barnes had for many years occupied the premises in question, part being used as a house, and the ground floor as a butcher's shop. During this time he had been served with a domestic supply. Until March 31, 1914, the only water charge had been in respect of the domestic supply. A resolution was passed by the Council in 1914 to levy a special charge of 1s. in the pound on the poor rate assessment on such premises for the use of water for other than domestic purposes. It was now contended that defendant used the water for washing-down his shop, in the scraping and cleansing of blocks and slabs, for the cleansing of knives and other utensils, and in the making of brine for "pickling," &c. The Corporation took the view that these were other than domestic purposes; and the demand was made for the extra charge. After the demand, the defendant continued to use the water; and, moreover, he paid the extra charge on Aug. 15. It was for the Bench to decide whether, by paying this extra charge after notice, the defendant could now claim that he was entitled to refuse to pay for the half year in question. If there was an implied agreement between the parties, he could not say that this bound the defendant for all time. He was quite entitled to object to it at any date. The decision of the Bench was exceedingly important, because the Corporation had the right, where they considered that the water was not being properly used, to cut off the supply. The case, of course, was also very important to butchers and other tradesmen who were supplied by the Corporation.

After some formal evidence by officials of the Corporation,

Mr. KONSTAM, for the defence, urged that at no time had defendant agreed to pay the rate as alleged. The Corporation had sent a demand note in respect of the rate; but defendant had not agreed to pay it. It had been stated that the Council had passed a resolution ordering the enforcement of the rate; but he urged that no steps were taken by the Council to acquaint the public at large as to the resolution. He maintained that the Council had no right to put in an extra charge for water of 6d. in the pound. The whole proceedings were *ultra vires* from the start. Further, the Corporation were not bound to give a supply of water for other than domestic purposes, though, where requested, they were bound to give it for domestic purposes. He urged that the brine tub, the cleaning of knives, the cleaning-down of the shop, &c., were all domestic purposes.

The CHAIRMAN (Sir John Blaker), in giving the considered judgment of the Bench, said the Magistrates found: (1) That there was, in fact, no agreement for a supply for other than domestic purposes, neither could an agreement be implied, it not having been sufficiently brought to the notice of the defendant that it was proposed to make a charge for such a supply, to enable him to agree or disagree—the very slight alteration in the form of the demand note being such, in the opinion of the Bench, as to pass unnoticed, as, indeed, the defendant swore it did. (2) The defendant used the water in exactly the same manner as he did before it was sought to recover the extra charge for other than a domestic supply; and the nature of the user was, in the opinion of the Bench, similar to the nature of the user in the case of *Metropolitan Water Board v. Avery*—viz., domestic—and, therefore, the defendant would not be liable to pay a special water charge. In these circumstances, the summons must be dismissed. The Magistrates were unanimous on the first point; the second was a majority decision.

It was pointed out on behalf of the Corporation that there was still another summons. This was adjourned *sine die;* and the Bench agreed to state a case on the point already decided. No costs were given.

The Charge against Walton Gas Officials.

In the High Court of Justice last Friday, an order was made transferring from the Surrey Quarter Sessions to the Central Criminal Court the trial of Thomas H. Lamb and George W. Ross (formerly Secretary and Collector respectively to the Walton-on-Thames and Weybridge Gas Company), who are charged with (1) stealing £100 8s. 8d., £17 10s., and £99 7s. 4d., the property of the Gas Company; (2) stealing £88 7s. and £445 6s. 4d., the property of the Company; (3) conspiring with each other to steal money, the property of the Company, and falsifying certain account books of the Company. Mr. Carr moved for a rule to bring up the indictment from the Surrey Quarter Sessions, so that the case should be tried at the Central Criminal Court, on the ground that it was not likely defendants would have a fair trial at the Sessions; some of the Justices being prejudiced against them. A Director of the Company was a local Justice; and other Justices constituting the Petty Sessional Court which committed defendants for trial wrongfully refused to allow cross-examination of the Justice. Neither the Justices nor the prosecution appeared to show cause against the rule.

Claim in Regard to Death from Gas Poisoning.

In the "JOURNAL" for the 9th of February, a report was given of proceedings in the Companies' Winding-Up Court, before Mr. Justice Astbury, of a case in which the executors of a man insured in the United London and Scottish Insurance Company, Limited (in liquidation), made a claim under a sickness and accident policy. It was specified in the policy that it did not insure against death or disablement by accident directly or indirectly caused to any extent by (*inter alia*) "anything swallowed or administered or inhaled." On April 18, 1912, the assured was found dead in Edinburgh in a house of which he was the sole occupant. His body was in the lavatory, where the gas was turned on, but not lighted. The Company repudiated any liability on the ground that death was caused by "inhalation." Afterwards they went into liquidation; and the Liquidator rejected the claim of the executors of the deceased under the policy, on the same ground. The executors appealed; and the sole point raised before his Lordship was whether the assured died from gas inhaled within the meaning of the exception in the policy. In giving judgment, he said the words in question, if read *ejusdem generis* with those before and after them in the condition, received their full meaning if they were treated as excluding the results of the assured's "swallowing or inhaling" anything, for medicinal or other reasons, which he might believe to be harmless. This construction, he thought, gave fair weight to the exception, was in harmony with the character of the excluded risks, and did no violence to the general character of the insurance. In his opinion the Liquidator's decision was wrong, and he decided that the claim must be allowed, with costs. The Liquidator appealed, and the matter came before the Master of the Rolls and Lords Justices Pickford and Warrington last Wednesday. The Master of the Rolls said the Judge in the Court below had held that he was justified in saying that the provision excluding death or disablement by accident caused by "anythins . . . inhaled" applied only to an intentional inhaling, such ag the taking of an anæsthetic. He (his Lordship) regretted that he could see no ground for this. The language, being clear, must be given effect to, even though the result was hard. It was not a case where the language was obscure, so as to admit of its being construed *contra preferentes*. The appeal must therefore be allowed. The Lords Justices gave judgment to the same effect.

MISCELLANEOUS NEWS.

TWENTY-FIVE YEARS' CO-PARTNERSHIP.

South Metropolitan Gas Company's Magnificent Record.

The subjoined striking summary of twenty-five years' results of the working of their co-partnership system appears in the current issue of the South Metropolitan Gas Company's "Co-Partnership Journal." The employees, it may be safely said, are hardly likely to find fault with such a record. The figures serve as a useful comment on a letter published in our "Correspondence" columns last week.

Summary of Twenty-five Years' Co-Partnership.

Year Ending June 30.	Price of Gas.	Bonus per Cent.	Total Bonus.	Stock Held by Co-Partners Dec. 31.
	s. d.		£	(Nominal Value £).
1889	—	Nest egg	6,863	—
1890	2 3	5	6,037	—
1891	2 3	5	10,010	—
1892	2 3 / 2 6	3	6,145	—
1893	2 6 / 2 5	4	7,872	—
1894	2 5 / 2 2	6	11,785	19,640
1895	2 4	6	12,892	25,180
1896	2 3	7½	16,906	40,360
1897	2 3	7½	18,000	48,380
1898	2 3	7½	18,207	56,450
1899	2 2	8¼	21,374	66,230
1900	2 1	9	24,592	68,205
1901	2 8	3¾	10,401	82,785
1902	2 3	7½	25,676	95,145
1903	2 3	7½	28,151	113,285
1904	2 3 / 2 1	8¼	33,696	138,395
1905	2 0	9¾	42,648	158,675
1906	2 0	9¾	43,962	185,500
1907	2 0	9¾	45,591	216,315
1908	2 3	7½	36,416	238,240
1909	2 3	7½	37,123	261,380
1910	2 2	8¼	41,328	276,660
1911	2 2	8¼	43,033	301,490
1912	2 2	8¼	45,351	312,025*
1913	2 2	8¼	48,348	237,925*
1914	2 2	8¼	49,189	348,905*

Total paid in bonuses £691,596.

* Upwards of £30,000 stock, belonging to pensioned employees and widows of co-partners, has been from time to time transferred to the ordinary share ledger, and is not now included in these figures.

IMPERIAL CONTINENTAL GAS ASSOCIATION.

The General Position in the War Area.

The Half-Yearly General Meeting of the Association was held last Tuesday, at the Cannon Street Hotel, E.C.—Sir CHARLES J. JESSEL, Bart., in the chair.

The SECRETARY (Mr. R. W. WILSON) read the notice convening the meeting.

The CHAIRMAN, in affixing the common seal to the Register of Proprietors, made the interesting statement that, since the war broke out, only £15,998 of stock had actually been bought and sold.

ABSENT DIRECTORS.

The CHAIRMAN: I rise to move—"That a distribution at the rate of 2¾ per cent. be declared upon the £4,940,000 capital stock in respect of the half year ending Dec. 31 last, and that the same be payable on the 15th of May, less income-tax at the rate of 1s. 10½d. in the pound." Ladies and gentlemen, I must first apologize for the somewhat scant attendance on this side of the table. No less than four of my colleagues are absent to-day. Sir Chandos Leigh, who has been a Director and a valued colleague for nearly 25 years, has been ill for some time; and, though I am glad to hear from his doctor that he hopes to be shortly among us again, he had to be absent to-day. Our valued colleague, Sir Corbet Woodall, has, I am glad to say, only been suffering from temporary indisposition. He has gone away for a short holiday; and he asked to be excused for to-day. Colonel Le Roy-Lewis has been away in South America on the business of another company; but he is now on his way home again. Last I come to our junior Director, Mr. Harold G. Palmer, or I ought to say Sergeant Palmer. He is the only one among us of military age; and last autumn, directly he had settled the affairs of his father—my predecessor in this chair—he enlisted as a sapper in the Royal Engineers. [Applause.] He speedily became a corporal, and shortly afterwards a sergeant; and now he expects any day to be ordered out to the front. You will wish him "God-speed and a safe return." [Hear, hear.] One of the proprietors who happened to know that these gaps had taken place in our ranks had written to the Secretary expressing some anxiety as to whether we were able to continue to conduct the business of the Association with the lessened number of Directors. I was able to assure him that it was the case. Our numbers are fixed at ten, as undoubtedly you know, by Act of Parliament; and it is a conveniently large number in the ordinary course of affairs, when sometimes several of us had to be abroad travelling on behalf of the Association. Unfortunately, that duty is now denied to us; and those who are left are well able to conduct the ordinary routine of the Association without hurt to it.

THE POSITION OF AFFAIRS IN FRANCE.

Of course, in intimating that the Continent is closed to us, I do not mean to include France. We hear constantly from France. Though our most important town (the most important town belonging to the Compagnie Continentale du Gaz)—Lille—is still in German hands, we are able to communicate with the Managing Director in Paris as to the other towns that are free from the enemy. With respect to Lille, some news has leaked through. The Germans sent away from Lille, through Belgium and Germany and Switzerland back to the unoccupied part of France, some of the older ladies and gentlemen of the town; and from these we have gathered some news with respect to the station at Lille. We hear that the German bombardment destroyed no less than 1350 houses, principally in the area supplied by the Compagnie Continentale. None of the gas-works suffered any damage. One of the works of the Gaz de Wazemmes, which also lights a portion of the town, and in which we hold some 17,000 odd shares out of 28,000, received slight damage from one shell. We understand that gas is being normally supplied, and that the consumption is of fair character. With respect to the electricity works of Lille, in which we are also largely interested, and which supply motive power as their principal source of revenue, they are, of course, not doing very much, because, as I daresay you have read in the newspapers, the Germans have removed from the French factories all the raw material, and, I believe in some instances, such parts of the machinery as they wanted for their own purposes. Therefore electric current for motive power is hardly required there. But the supply is still continued for lighting. With respect to Armentières, which is occupied by a British force, I regret to say that, since I last addressed you, the town has been bombarded on several occasions. The works were much injured, and also the distribution system. The supply of gas there has had to be discontinued. In the small town of Estaires, which is also within the British lines, the supply of gas was temporarily discontinued for I regret to say that a German aeroplane flew over it a month or so ago, and discharged a bomb which went through the retort-house roof, killing one poor man and mortally injuring another. I now come to our other interests in France—those of the Nancy Gas Company, in which we are large shareholders. Nancy has received a few shells and a few visits from aeroplanes from time to time; but the gas-works, up to the latest date of our information, have received no injury. The small town of St. Dié has been bombarded so many times that I cannot carry the number in my head; but the works received insignificant injury—such damage as could easily be repaired—and the supply of gas still continues. The Nancy Gas Company hold the majority of the shares in the Pont à Mousson Gas-Works. This unfortunate town has also been bombarded frequently during the last nine months; and the gas-works have received a certain amount of damage. One gasholder was put out of action; but, with the small consumption of gas now going on in the town, the gasholder that remains intact has been able to do its work sufficiently well. I regret to say that the Manager of these works was killed some time ago. He met a soldier's death at the front. His place at the works has been filled by the foreman, who, in spite of the shelling, continued at his post, and thereby encouraged his men to do the same. [Applause.]

IN AUSTRIA-HUNGARY AND BELGIUM.

I have little to tell you with respect to our interests in Austria-Hungary and Bohemia. We really know nothing about what is going on there; but we have every reason to suppose that things are in a more or less normal condition. This applies, also, to our interests in Belgium. The Germans have strictly forbidden our servants in Antwerp and Brussels to communicate with us here in London. In the interests of the business, they have faithfully carried out these orders; and I have really nothing to tell you as to what is going on in either of the cities. All we do know, or, rather, all we believe to be true, is that business—of course, of a diminished character—is also proceeding there under fairly normal conditions.

NEWS FROM GERMANY—PATRIOTIC BUT LOYAL OFFICERS.

With respect to Germany, we can tell you something more. I do not say for one moment that the position is in any way altered since I last addressed you in November. But we have not been kept in entire ignorance of what is transpiring there. Just after our last meeting, our Secretary, with the full knowledge and consent of the Foreign Office here, went over to Amsterdam, and, on Nov. 7, met Messrs. Jörger and Körting, respectively our Agent and Chief Engineer at Berlin, who also journeyed to Amsterdam with the permission and consent of their Ministers. I should like, having mentioned their names to you, to say that these gentlemen, from what we hear, though patriotic Germans, have proved, in this crisis in our fortunes, most loyal to the interests of the Association. [Applause.] Their loyalty to their country is not involved in the slightest degree in their loyalty to the Association. Mr. Körting you, of course, know well—at all events, by name. He is the third in generation to serve the Association—his father and grandfather were old servants; and his name has been mentioned from time to time at the meetings of the proprietors. Mr. Jörger has been our Agent for two years; and I remember telling you how I had every reason to believe that we had made the right choice in appointing Mr. Jörger to the position which had been long held, and so well held, by Mr. Delbrück. I believed it then; and I am sure of it now. We have the advantage at this crisis of the position that Mr. Jörger holds in Berlin—his position from the social and commercial points of view; and I am certain that much trouble, anxiety, and loss to the Association have been saved by the fact that we had secured him as our Agent there. Mr. Wilson learned from these gentlemen how difficult, and perhaps how critical, matters were at the commencement of hostilities. After a bit, things settled down, and business was carried on by our officers without let or hindrance, and State control was exercised with great civility—the principal object, of course, being that no money should reach this country, and that business should be carried on in a proper manner, both with respect to the consumers and our German employees. Up to that date—I am speaking of the first week in November—the British employees of the

Association were allowed to go about their business (there are about half-a-dozen of them) without any restrictions, except of quite a minor kind; and they carried out their duties very much in the usual manner. The gas consumption had not been affected very much; and the average decrease for the three months of August, September, and October had been only some 10 per cent. I do not think I can do better than read an extract from Mr. Körting's own report with respect to what I want to say now. Mr. Körting wrote:

> Everybody did his best to be of service to the concern and his colleagues. If on our staff anybody had an enemy within the Association or without, now was the time and opportunity for him to give vent to his feelings with impunity; but I am thankful to say that not one single personal complaint came to my ears either by letter, word of mouth, or through the newspapers against any officer of the Association—German or English. I, personally, am grateful for the ready performance and the good will of every one of my assistants, and of all our clerks and workmen. Although I can say with good conscience, it has been my constant desire to do the proper thing towards them, following therein the good example of our Directors, I have been agreeably surprised by the general *esprit de corps*.

I may say in this connection that the collection of the gas accounts proceeded with a great deal more regularity than had been anticipated. The situation with respect to the coal supplies was reported to Mr. Wilson as having been entirely satisfactory; and Mr. Körting did not anticipate there would be any difficulty in this respect in the future. At Hanover, the situation was quite satisfactory. A contract had been entered into with the town of Hanover and the Association's representative, under which contract the conduct of the business by the town authorities of Hanover was arranged for on account of the Association during the duration of the war. The technical part of the business was being carried on just as usual by the Chief Engineer (Mr. Anderson), subject to reference to the town when necessity arose. Here, too, the gas consumption had only been adversely affected, up to the time of which I am speaking, to the extent of some 10 per cent. Towards the end of November, information was received that the English employees of the Association, those in Berlin and Mr. Anderson in Hanover, had been interned in the camp at Ruhleben. This action on the part of the German Government was taken with the view—I think a mistaken one—of reprisals for the supposed treatment accorded to German subjects in like position in this country. These gentlemen, I am sorry to say, are still at Ruhleben, with the exception of Mr. Anderson, who, during the term of his internment, reached the mystic age of 55, when one is supposed to be no longer dangerous, even to Germany. He was released, and has returned to Hanover, and, from what I gather, has been going about his business much as usual. I should like to say on this point that, poor perhaps as the Association may be, the Directors thought it right and proper to respond to an appeal made by Sir Edward Goschen to contribute towards a fund for the relief of the unfortunates interned at Ruhleben, many of whom are wanting food and the necessaries of life. We have subscribed £100 towards the fund.

A SECOND VISIT TO AMSTERDAM—THE CONSUMPTION OF GAS.

In March last—again, of course, with the permission of our Government—Mr. Wilson undertook a second time the arduous voyage to Amsterdam, to meet our representatives. But, except for some information with respect to the internment of the British employees, he learned very little fresh as to our position in Germany. The business had been going on satisfactorily, both in respect of the manufacture and the distribution of gas; and the only difficulties encountered were those due to the absence on military duties of many of the clerical and technical members of the staff. It may perhaps be interesting to give you the figures that Mr. Wilson obtained with regard to the consumption of gas in Berlin during and since the half year to Dec. 31 last. The average decrease was 12·13 per cent. in the half year. In January, it was 12¼ per cent.; and in February, 7¼ per cent. In Hanover, the results were even better. The decrease in the half year was only 8·8 per cent. In January, it was 7·17 per cent.; and in February, it was only 4·81 per cent. Of course, it must be remembered that, on account of the scarcity and the high price of oil and of coal for domestic use, the public had been strongly recommended by the authorities to use gas and electricity for lighting, and coke for heating. The result has been that there has been a considerable demand for slot meters; and the stock of coke has largely diminished.

A TIMELY PAYMENT.

At the end of our meeting last November, one of the proprietors came to me, and said: "You entirely forgot to mention Frankfort." I am afraid that I did. As you remember, Frankfort is no longer one of the stations of the Association. Our interest there is represented by shares in the Frankfort Gas Company; and it is an important interest. There are in the Company 13,600 shares of Ms. 1000 each; and the Association hold 7705 of these shares. The financial year of the Frankfort Company ends at March 31. As a rule, the general meeting is held, and the dividend is paid, in the month of August. By some accident—and it was for us a fortunate accident—the meeting was held last year in July; and we luckily received the dividend, amounting to some £37,500, during that month—about three weeks before the beginning of the war. From one of our old staff who was employed by the Frankfort Company, we learned that up to very recently things were going on in quite a normal manner; and we have every reason to believe that a dividend will be earned, even if it is not paid to us until the conclusion of the war.

THE LAST DISTRIBUTION UNTIL PEACE COMES.

Now, finally, I come to the matter of the distribution that I have proposed to you. It stands on all-fours with the proposal made last November. Some misconception has arisen as to this. One proprietor has even written to us in the belief that a distribution is going to be made from the reserve fund. I explained last November, and I wish to explain again, that we were earning fairly normal dividends up to June 30 last; and, in ordinary circumstances, 4½ per cent. would have been paid as usual last November. We were almost certain that it had been earned. We have now information which makes it perfectly certain; but we are unable to present you, as proprietors, with a balance-sheet signed by the Auditors. Therefore we are precluded, under our Acts of Parliament, from proposing a normal dividend. We put it in this way: We are proposing to make you a distribution out of the resources of the Association. We do not pretend at the moment to say from what funds the money comes; we do not propose to earmark it in any way. Happily, we have sufficient available money—money practically in cash—with which to make the distribution, if you pass the proposition. It is, however, only fair to warn you that, until peace comes, this distribution cannot be repeated. No doubt (I have no doubt) some kind of profit is being made in Germany—at all events, a fair profit is being made on the capital embarked in that country at least. But the profit is in the "bush;" and until it comes to hand, we cannot distribute it. I do not think that you need despair on that account of the Association and its future. The old ship of the "I.C.G.A.," during its long career of some ninety years, has encountered many a gale. I should say it has never been in quite such a bad storm as this; but I have every reason to hope and believe that it will reach port, perhaps a little battered, but it will get there safe and sound enough. [Applause.]

Mr. ARTHUR LUCAS seconded the motion.

Mr. A. GOORE inquired if the money of the Association was being paid into banks in the different towns, and who had control of it.

The CHAIRMAN said all he could reply was he supposed the money was safely with the banks abroad. He could not say who had control of it; but he could tell the proprietors this much, that it had not been confiscated, so far as he knew. Replying to another inquiry, he said that there was half a million sterling invested in Consols over here. The interest went to pay, among other things, debenture interest; they had also income-tax to pay.

Mr. H. CHESTER asked whether the distribution could be so arranged as to avoid income-tax being paid upon it—say, as a return of capital, or something of that kind. This would save the proprietors 2s. 6d. in the pound.

The CHAIRMAN replied that he was afraid that, legally speaking, if they went in for the distribution of capital, one of the first things that would have to be done would be to pay off the debenture stock at £105. He was afraid this would be fatal to any such scheme as proposed by the proprietor.

Mr. B. BOND inquired whether the dividends on the stocks and shares held by the Association had not already had income-tax deducted. If so, did the Directors propose to deduct the income-tax again.

The CHAIRMAN explained that income-tax on the dividends from abroad had not been deducted. Remittances received over here were paid without any reference to income-tax at all. If the proprietors were only to receive a distribution from home investments, he was afraid they would have very little.

Sir PERCIVAL LAURENCE asked whether it was not the case that, where the average of profits on three years would work out hardly, representations to the Treasury would receive attention.

The CHAIRMAN answered that they had obtained advantage in this way: Last January they would, under normal circumstances, have paid income-tax on the average of the profits for 1911, 1912, and 1913. They were allowed to count 1912, 1913, and 1914 for the three years on which an average would be taken. As, however, they could not submit audited accounts for the year 1914, the Commissioners of Income Tax accepted provisionally an estimated figure for that year. In this way the Association benefited to the extent that where, in ordinary circumstances, they would have paid an amount of about £71,742, they paid £52,195, or £19,547 less.

Sir PERCIVAL LAURENCE asked whether he understood correctly that the Board did not think they would be able to make a further distribution until the end of the war.

The CHAIRMAN: That is so.

The motion was unanimously carried.

Proposed by the CHAIRMAN and seconded by Mr. ROBERT TINDALL, Mr. Arthur Lucas was re-elected a Director.

Moved by the CHAIRMAN, and seconded by Mr. H. GOODWIN NEWTON, the Right Hon. Sir Guy D. A. Fleetwood Wilson, G.C.I.E., K.C.B., was re-elected a Director.

Proposed by the CHAIRMAN, and seconded by Mr. HENRY BIRCHENOUGH, C.M.G., the Hon. Sir E. Chandos Leigh, K.C.B., K.C., was re-elected a Director.

On the proposition of Mr. HORACE PILCHER, seconded by Sir LUCAS RALLI, Mr. C. F. Dendy Marshall, M.A., was re-elected one of the Auditors.

Mr. C. I. THORNTON proposed a hearty vote of thanks to the Chairman and his colleagues, and remarked upon the great anxiety the Board must always have over them in these critical times. He also suggested that the Secretary should convey to Sir Chandos Leigh the sympathy of the proprietors with him in his illness.

Mr. BERNARD F. HARRIS seconded the motion, which was cordially agreed to.

The CHAIRMAN expressed, on behalf of his colleagues and himself, their sincere appreciation of the confidence of the proprietors.

SOUTHAMPTON GAS COMPANY.

In presenting the report [*ante*, p. 294] at the half-yearly meeting of the Company last Wednesday, the Chairman (Captain A. J. Corse-Scott, J.P.) said the period under review had been a good one for the Company so far as sales of gas were concerned; the increase being 14,622,000 cubic feet, or 3·51 per cent., over the corresponding period of 1913. The increase, no doubt, would have been much larger, but for the curtailment of all outside lighting, the reduction in the hours of opening of licensed premises, and the removal from the town of a large number of consumers through the closing of the docks. The coal carbonized was nearly 3000 tons less; but the quantity of gas produced per ton was greater. There was also a saving in the coke used for fuel, the result of the working of the new retort-house. The expenditure was lower than in 1913, partly owing to the new retort-

house effecting a saving in renewals, and partly to a lesser amount having been written-off for depreciation. The profit for the half year, together with £2767 brought forward, was sufficient to allow of the payment of the maximum dividend of 5 per cent., and leave a balance of £5586 to be carried forward to the next half year. This amount would be found useful, to enable the Directors to keep the increase in the charge for gas to a lower figure than would have been the case without it. From the commencement of the war, difficulties arose as to supplies, because the Admiralty commandeered the boat which carried the Company's coal, thus forcing the Directors to obtain whatever vessel was available. After paying very heavy freights, the Board were able, in April, to again obtain possession of their boat, but at an increased cost. The rapid increase in the cost of coal and freights had forced the Directors to raise the price of gas 4d. per 1000 cubic feet to ordinary consumers, and to reduce by 1 cubic foot the quantity given to prepayment consumers for a penny. Since the outbreak of war, seventy of the employees had joined the forces. The Directors had promised to reinstate them on their return, and had also granted allowances to their dependants. Those who remained at home were all doing their best to keep the work going. To meet the increased cost of living, the Board in February granted a war bonus to all employees earning less than £160 a year.

The report was adopted, and the payment of the maximum dividend agreed to.

SHANGHAI GAS COMPANY, LIMITED.

Fifty-First Annual Report.

The report presented at the annual meeting of the Shanghai Gas Company on the 27th ult. shows that the profit on the working in the year ended Dec. 31 last, was 266,068 taels, compared with 299,872 taels for 1913—a decrease of 33,804 taels. The net profit amounted to 210,668 taels, against 254,722 taels—a decrease of 44,054 taels. Of this difference, 8874 taels is attributable to the low dollar exchange which again prevailed. The balance at the credit of the profit and loss account, after crediting the account with 19,809 taels carried forward, and debiting it with 48,000 taels for the interim dividend at the rate of 4 per cent. paid on the 10th of August, amounted to 182,447 taels, which the Directors recommended should be appropriated as follows: To pay a final dividend of 3 per cent. for the year 1914 (making 7 per cent.), 36,000 taels; to write-off for depreciation of land and buildings, 4076 taels; do. of manufacturing and distributing plant, 121,709 taels; do. of furniture, 893 taels—making a total of 126,678 taels—and to carry forward 19,799 taels. During the year 457,249,500 cubic feet of gas were sold to private consumers; being a decrease of 10·6 per cent.; but the output of gas for cooking, heating, and industrial purposes progressed satisfactorily. The total quantity of coal carbonized was 32,893 tons, and in addition, 364,233 gallons of liquid fuel were used in the manufacture of gas. The prices for both coal and oil were considerably higher than those paid in the previous year. There was a largely increased demand for tar; and, owing to the strength of the market, higher prices were realized for coke. The price of sulphate of ammonia remained low.

The reports presented during the year by the Company's Engineer-in-Chief (Mr. F. W. Potter) furnished the following particulars: Coal and oil carbonized, 41,999 tons; gas manufactured, 511,573,900 cubic feet; yield of gas per ton, 12,180 cubic feet. The only additions to the manufacturing plant were a "Simplex" vaporizer, a compressor, and tar-distilling plant consisting of two stills and a tank—the latter being necessitated by the increased demand for desiccated tar. The quantity of gas sold during the year was 470,572,700 cubic feet; used on works, &c., 8,933,100 cubic feet; unaccounted-for and in stock, 32,068,100 cubic feet; unaccounted-for in distribution, 6·2 per cent. About 4·3 miles of new mains were laid.

THE PRICE OF GAS IN MANCHESTER.

Increase of Sixpence per Thousand—Gas and Smoke Abatement.

At the Meeting of the Manchester City Council last Wednesday, the members had before them the questions of smoke abatement and the proposed increase in the price of gas.

The Sanitary Committee presented a report in relation to the pollution of the air, and, in moving its adoption,

Mr. J. T. Jackson, the Chairman, paid a tribute to the Air Pollution Advisory Board on their work, and particularly to the co-opted members of the Board, whose counsel and knowledge had, he said, been of very great value in dealing with the smoke evil.

Mr. E. D. Simon (the Chairman of the Advisory Board) spoke of the way in which the Board had sought to avoid or minimize air pollution in the city. He emphasized the importance of efficient fire-grates, and of creating a strong public opinion regarding the evil of cutting off sunlight by smoke. In his judgment, a supply of cheap gas was better than all other reforms put together for reducing smoke. Unfortunately, for three years the Gas Committee were under a bond to contribute £50,000 a year in relief of the city rates. When this period was ended, he hoped public opinion would be so strongly expressed as to cause gas to be sold at cost price. He feared the raising of the price of gas would prove the greatest set-back to the smoke abatement work that it had yet had.

The report was adopted.

The next business before the Council was the consideration of a report of the Finance Committee on the financial bearing of a proposal of the Gas Committee in regard to an increase in the price of gas. It was stated that a conference had been held by five members of the Finance Committee and a like number of the Gas Committee relative to the Gas Committee's proposal to add 6d. per 1000 cubic feet to the price of gas, bringing it up to 2s. 8d., or 2s. 6d. if the amount were paid within a month from the delivery of the bill. The result of the conference was to confirm both Committees in their previous decision—that the proposed advance was called for.

A long memorial was presented from the Manchester and Salford Sanitary Association, urging the Council not to raise the gas price lest they should thereby decrease, if not entirely destroy, the improvement in the air of the city recently achieved.

Alderman Copeland moved the adoption of the report, and that the Gas Committee be authorized to give effect to it by raising the price of gas 6d. per 1000 cubic feet from the 24th of June. So far from the Gas Committee asking too much, he thought they had been very modest, for they really required an extra charge of nearly 8d.

Alderman Kay (the Chairman of the Gas Committee), in seconding the motion, argued that the situation of the gas undertaking at the present time was such as to make the higher price now asked an absolute necessity. If matters were likely to be normal next March, his position would be easy; but no one could say when normal conditions would return. Already the Gas Department had suffered loss by delaying the operation of the proposed advance; there was a deficit on last year's working. Their reserve fund had come to an end, and the Council required the Committee to contribute £50,000 each year in relief of the rates. This was the policy of the Council, and they must take the responsibility for it. The Government had prohibited the export of many gas residuals. The Committee's principal customers for pitch used to be France and Belgium, who employed it for the making of briquettes; but now they did not require it. In all the circumstances, he asked the Council to accept the proposition in the belief that it was necessary, and that it would be easier to reduce the price of gas than to reduce the rates when once they had been advanced.

Mr. J. R. Scott said at the last meeting of the Council he moved that the Gas Committee's proposal be referred back for the fuller report. No further information had been supplied; but, as a matter of courtesy, Alderman Kay sent him a private and confidential memorandum on the subject. After consideration of it, he thought he was right in moving, as an amendment, that the advance in the price of gas be 3d., instead of 6d., per 1000 cubic feet. One of his reasons for doing this was that cheap gas was an important factor in the prevention of air pollution. As to the financial aspect, he said the estimated deficit for this year was £75,000. This sum did not include £50,000 given to the rates, but it presumably did include under taxes about £7000 for income-tax. But what was the real financial position? The physical assets of the concern were said to be £2,750,000. This sum might be taken as correct, without reckoning anything for franchise rights or goodwill, which in a commercial concern would figure quite rightly at a large amount. The liabilities were only slightly over a million sterling. This arose from the fact that the policy of the Committee for years past had been one of double depreciation. They paid off their capital liabilities by means of the sinking fund, they fully maintained their plant out of revenue, and they also charged out of revenue a sum equal to the sinking fund charge for renewal of obsolete plant. Besides this they even extended their plant considerably from time to time out of revenue. The net result of this was that in about fifteen years this policy would, if pursued, present to the next generation a free gas undertaking worth from three to four million pounds. He submitted that, in the exceptional circumstances of the war, the citizens might justifiably enter into a small part of their inheritance now, and face the trifling loss incurred by advancing the price 3d. instead of 6d.

Mr. J. Hislop seconded the amendment.

Mr. W. T. Jackson spoke strongly in support of the amendment. He said that in so doing he meant no reflection on the Gas Committee. It was not the Committee, but the Council, who dictated the payment of £50,000 a year in relief of the rates, thereby placing a burden on shoulders least able to bear it. He submitted that this policy of profits and rate relief was but juggling with the question. The correct way to meet requirements was direct taxation.

On a division, 34 voted for the amendment and 61 against it. A further amendment, that gas supplied through prepayment meters should be exempt from the increase, was also defeated. The motion was therefore carried.

NOTTINGHAM GAS UNDERTAKING.

Profitable Year's Work.

Nottingham has ample reason for satisfaction regarding the past year's working of the Corporation gas undertaking; the report of the Committee presented at yesterday's meeting of the Council disclosing substantial profits, of which £39,000 is to be applied in reduction of rates, this amount, in spite of diminished income, totalling the same substantial contribution as in the preceding twelve months. There is, however, an indication forthcoming of probably increased charges to consumers in the near future, having regard to extra outlay upon coal. In this connection it is pointed out that the step has already been rendered obligatory in connection with many other large concerns. Arrangements have, it is explained, been made for an important extension of the vertical system of retorts. The first instalment, completed some months ago at the Radford works, was of the Glover-West type; but the new plant to be laid down at the larger works at Basford—the main source of the city's supply—is to be the Woodall-Duckham system. In consonance with the policy which has been consistently followed under the present *régime*, financial provision for the work is to be made out of the renewals fund which has been steadily built up from profits.

Signed by Mr. Alderman A. Ball as Chairman (the Vice-Chairman of the Committee being Mr. Gover Ford), the report states that the quantity of gas sold during the year amounted to 2,181,615,400 cubic feet, against 2,251,302,700 cubic feet the previous year—a reduction of 69,687,300 feet. The total income for the year had amounted to £367,516, and the expenditure to £237,433; leaving a balance of £130,083 to be carried to profit and loss account, *plus* £4427 carried forward from last year and banker's interest £2628, making a total of

£137,137. After deducting the interest on capital, the contributions to the sinking funds, and placing £2500 to the depreciation of stoves, there remained a balance, including bank interest, of £79,708 at the disposal of the Council. The Committee recommended that, out of this sum, £39,000 be handed over to the Finance Committee in aid of the general district rate, £30,000 be placed to the renewals fund, and that the balance £10,708 be carried forward in view of the great increase in the price of coal. The markets for coke, pitch, sulphate of ammonia, and all other residuals, with the exception of creosote, had been most unsatisfactory during the first nine months of the financial year, but had improved since January, with the exception of pitch, the market for which was weaker than for many years past, and would seriously affect next year's profits of the undertaking.

The Committee have placed a contract to build an installation of Woodall-Duckham retorts at the Basford works, to replace a portion of the horizontal retorts, at a cost of between £60,000 and £70,000, the whole of which sum will be provided out of the renewals fund. The Committee report that the various gas and chemical works and the distribution department are in good condition. They recognize, however, the great importance of continuing the contributions to the renewals fund of such amounts as will enable them to complete the conversion of the Basford works into an up-to-date gas manufacturing station. The amount of gas sold per ton of coal carbonized was 11,675 cubic feet, as against 11,623 cubic feet last year and 9549 cubic feet in 1904. The Committee regret that, owing to the lighting restrictions and the falling off in Nottingham trade, the consumption of gas has fallen off considerably since the declaration of war, and would seriously affect future profits. They also regret they were unable to make the promised concessions in the price of gas on Jan. 1, on account of the war and the unsettled state of both the coal and residual markets. The Committee add: "The coal question is one of the most serious problems for gas undertakings throughout the country, and unless some concessions are made from the present market prices, your coal for next year will cost approximately £50,000 more than last year. Substantial increases in the charges for gas have already been made by many large gas undertakings, and your Committee will probably be compelled to consider the revision of their charges in the near future."

Report of the Engineer and Manager.

The report of the Engineer and General Manager (Mr. John Wilkinson) which is attached to the Committee's report, dealing with the period to March 31 last, states that 186,329 tons of coal and 17,463 gallons of oil were utilized in manufacturing the following products: Coal gas, 2,271,561,000 cubic feet; water gas, 6,445,000 cubic feet – total, 2,278,006,000 cubic feet; coke for sale, 82,211 tons; tar, 11,490 tons; ammoniacal liquor (10 oz.), 30,370 tons. The amount of water gas, it is explained, equalled 0·28 per cent. of the total gas made. By far the largest quantity of coal was carbonized at the Basford works, where 99,212 tons were used, the Eastcroft works being responsible for 51,759 tons, and Radford for 35,958 tons. The respective outputs of gas were: At Basford, 1,237,847,000 cubic feet; Eastcroft, 624,760,000 cubic feet; Radford, 415,399,000 cubic feet. The quantity of tar distilled at the Giltbrook chemical-works was 9716 tons, which yielded products as follows: Crude carbolic acid (60's), 12,972 gallons; crude naphtha, 56,404 gallons; redistilled light oil, 70,786 gallons; creosote, 554,510 gallons; brick oil, 27,465 gallons; black varnish, 3080 gallons; crude naphthalene, 106 tons; ammoniacal liquor (10 oz.), 586 tons; pitch, 5521 tons. In addition to this, 134,789 gallons, or 674 tons, of crude tar, and 37,525 gallons of creosote were used for the manufacture of 172,314 gallons of specially prepared tar for road making and spraying purposes. The Giltbrook works were also used for the manufacture of 2888 tons of sulphuric acid (100 per cent.), and 1590 tons of oxide of iron for gas purification purposes. At the Basford ammonia works the equivalent of 32,092 tons of 10-oz. ammoniacal liquor was distilled during the year, which produced 2395 tons of sulphate of ammonia. The vertical retorts at Radford worked continuously up to Jan. 23 last, when the contractors decided that it was necessary to make certain alterations to the heating arrangements in order to obtain the guaranteed results, and also to prevent excessive wear and tear of certain portions of the settings. These alterations would probably be completed by June 30 next, when another test of the installation will be carried out. The work of clearing the site at Basford, upon which the installation of Woodall-Duckham vertical retorts is to be erected, is well forward, and the Contractors expect to commence operations early in June. It was originally anticipated that the installation would be completed by Dec. 31 next; but the present shortage of labour and materials is almost certain to cause delay. Such delay will not, however, endanger the gas supply during the winter.

Distribution Department.

In connection with the Distribution Department, Mr. Wilkinson gives the following details of the sale of gas during the year: Ordinary consumers, 1,530,267,500 cubic feet; prepayment consumers, 544,374,300 cubic feet; public lamps, 106,973,600 cubic feet; total, 2,181,615,400 cubic feet. These figures indicate a decrease of 69,687,300 cubic feet, or 3·1 per cent., when compared with the sale of gas (2,251,302,700 cubic feet) for the previous year. There was a continuous increase in the output of gas from the beginning of the financial year up to the outbreak of war; but a serious decrease then set in, and still continues. The following are the comparative receipts for gas sold: Year ended March 31, 1915, £265,985; year ended March 31, 1914, £273,663; decrease, £7678.

The gas unaccounted for during the year was 95,390,600 cubic feet, or 4·23 per cent., as compared with 81,573,300 cubic feet, or 3·50 per cent., for the preceding year. Attention had been drawn in previous reports to the question of "gas unaccounted for," and Mr. Wilkinson adds that the percentages in future years ought not to vary to the same extent as during the last few years. The sale of gas per ton of coal carbonized again shows a slight increase—namely, 11,675 cubic feet, as compared with 11,623 cubic feet for the previous year. There were 991 additional consumers connected to the mains during the year; making a total of 82,427 consumers at March 31. The number of public lamps in use at the same date was 8175. The average consumption per consumer equalled 24,859 cubic feet, as compared with 26,057 cubic feet in the previous year. The total length of mains laid at March 31 was 405·84 miles; 3·93 miles having been added to the canalization during the year. There were 1348 new gas services connected to the mains, against 1842 in the previous year. The number of meters fixed to March 31 (including 498 lamp meters) was 82,925; being an increase of 1001 meters on the previous year. Of these, 80,184 are owned by the Gas Department, and 2741 by the consumers. The demand for prepayment meters still continues; and at the end of the financial year 42,480 of these were in operation—an increase of 758 on the previous year. The position of gas in regard to its application for trade and domestic purposes, other than lighting, has been maintained.; and on March 31 there were in use about 34,114 gas cooking-stoves, 17,953 gas-fires, and 857 gas-engines. Of the 34,114 cookers fixed, 9700 were rented from the department and 23,656 supplied rent free with the automatic meters. There is also in use a large number of other appliances of almost every description which have not been summarized. The orders and calls for attention of various kinds from consumers were 83,173, against 86,808 for the previous year. The re-arrangement of mains supplying the Ruddington district was completed during the year; but other important main laying work will, Mr. Wilkinson reports, remain in abeyance until the return of more reasonable prices for mains, lead, &c.

The returns of the manufacturing operations of the respective gas and chemical works have been maintained at a satisfactory standard, and every possible advantage has been taken of the cheaper local coals. These factors have had a material effect upon the amount of surplus profit now at the disposal of the Committee. Favourable contracts for coal have also assisted the year's working; but this advantage was counterbalanced to some extent by the low prices obtained for coke during the earlier part of the financial year. Heavy stocks quickly accumulated, and the Committee were compelled to arrange large contracts for forward delivery at the reduced prices. The position was entirely reversed during the latter part of the year, when coke stocks rapidly disappeared and prices advanced; but the forward contracts prevented the Committee from taking full advantage of them. The pitch market was also adversely affected in consequence of stoppage of shipments to Belgium and France. The Committee were covered up to the end of the financial year by contracts which had been made at apparently low prices; but these contracts eventually turned out very much to their advantage. The present and prospective position of the pitch market was about as bad as it was possible to imagine. Huge stocks were accumulating at tar distilleries, and normal prices could not be expected for some considerable time after the termination of the war. The question of coal supplies and prices was thoroughly appreciated by the Committee, and any comments thereon may, Mr. Wilkinson observes, not be necessary; but he adds that it is impossible to point out too strongly the fact that the abnormally high prices now demanded by colliery proprietors for forward delivery will seriously affect the finances of gas undertakings, and substantial increases in the prices charged for gas are already becoming general. The position is rendered all the more difficult in consequence of considerable increases in the prices of all other materials used on gas-works; but the price of coal is unquestionably the most vital matter. The following are the comparative expenditures for coal and receipts for residuals during the last three years:

	Expenditure for Coal.		Receipts or Residuals.
Year ended March 31, 1915 . . .	£103,626	..	£86,581
,, ,, ,, 31, 1914 . . .	111,013	..	94,326
,, ,, ,, 31, 1913 . . .	102,023	..	98,791

The actual result of the revenue account for the year is represented as follows: Total receipts, £367,516; total expenditure, £237,433; gross profit, £130,083. The gross profit for the previous year was £131,917, and £129,305 for the year ended March 31, 1913. Annexed to Mr. Wilkinson's report are tables showing the development of the undertaking during the last ten years, and the comparative workings per ton of coal and per 1000 cubic feet of gas sold for the years ended March 31, 1914 and 1915.

The statement of annuity capital in connection with the undertaking shows a present total of 6191 annuities of the nominal amount of £50 each, the amount aggregating £309,550; the other sums representing capital invested being: Loan capital, £230,667; debenture, £55,521; and consolidated stock, £450,997—making a total of £1,046,735. An analysis of the revenue account reveals among other interesting figures that coals, during the past year, including carriage and unloading, cost £103,625; wages for carbonizing, £14,370; repair and maintenance of works and plant, including renewal of retorts, £34,997. In the distributing department the salaries of inspectors and clerks in light office and other wages amounted to £10,642; repair and maintenance and renewal of mains and service pipes, including wages, £12,236. Rates and taxes amounted to £26,871. The reserve fund and rest account is now represented by £182,854, compared with £173,211 last year.

The Profits and Rate Aid.

Although there had been some misgivings entertained in Nottingham as to whether, consistently with sound finance, the Gas Committee, in face of considerably reduced income, could be expected this year to contribute as large a sum in relief of local burdens as they provided in 1914, it has been determined to take the same amount from the profits—viz., £39,000—as was found twelve months ago. Assuming there was justification for the heavy demand last year, the present state of the accounts, despite the diminished revenue, appears to warrant a continuity of the process, for the figures disclose that whereas last year, in a period of greater revenue, the sum placed at the disposal of the Council, after allowing for repayment of interest, &c., was £75,426, this year, upon a smaller basis of receipts, there is £79,908 available, which is more than accounted for by the diminished expenditure of over £13,000.

The Gas Light and Coke Company have allowed the Islington Borough Council a sum of £284 in respect of lamps which have been out of lighting in the March quarter. This allowance is calculated upon a basis of 6d. per 1000 cubic feet of gas unconsumed.

HALIFAX GAS CHARGES INCREASED.

There was some discussion at the meeting of the Halifax Town Council last Wednesday, with regard to a proposal of the Gas Committee that the prices charged for gas for different purposes should be increased 6d. per 1000 cubic feet all round, with the exception of the prepayment consumers. The rate to these consumers is only to be increased by 1d. This is largely a matter of expediency. The coin-meters are at present set at 2s. 6d. per 1000 cubic feet, with a rebate of 1d. from the amount abstracted from the money-box. The rebate will now be withdrawn, and the price will be 2s. 6d. For gas supplied through ordinary meters the rate will be advanced from 1s. 10d. and 2s. to 2s. 4d. and 2s. 6d. per 1000 feet; and for gas supplied for industrial heating the charges will be advanced from 1s. 10d. to 2s. to 2s. 4d. to 2s. 6d. Power rates will be advanced from 1s. 7d. to 1s. per 1000 cubic feet to 2s. 1d. to 1s. 6d.

Alderman TAYLOR moved as an amendment that the advance be 3d. per 1000 cubic feet instead of 6d. He did so because he felt certain that the policy the Committee were pursuing was a wrong one. It was a policy which was forced upon them by the abnormal state of affairs at the present time. If this was so, then he claimed that the whole of the town should assist in bearing the burden, and not allow it all to fall upon a Committee. If the price of coal was so much at the present time that the Committee could not meet the extra cost without putting the price up 6d., the Council ought to be more magnanimous, and not allow the whole of the burden to fall upon the gas consumer. They had to consider where the matter was going to end, and, further, what the Committee had been striving to do for the last two years. They had increased the sale of gas; but it was a moot point whether customers, faced with the increased cost, would not adopt another power which would be more economical.

Mr. CLAY, in seconding, said he thought the Council should hesitate before passing a resolution like that proposed. In the first place, it implied a reversal of the policy adopted so recently as last year, when the Committee came before the Council with strong arguments in support of a scale to supply day loads, &c. The Council, on the strength of those arguments, agreed to the proposals. What the Committee now proposed was a reversal of this policy to some extent. The suggestion was the application of a 6d. rise all round. It meant that for the ordinary consumer they were making an advance of some 25 per cent., and for the large consumer an advance of at least 33 per cent., ranging up to 40 per cent. At the present time the large consumers took only one-sixth of their turnover. This might be true; but what would happen if those large consumers were lost to them? Capital charges would remain the same. They would economize on labour; but the fixed charges would continue as before.

Mr. WADDINGTON hoped the amendment would not be carried. The Gas Committee had gone fully into the question of charges; and he thought it was commonly known that the corporations in the North of England had advanced the price of gas, or were about to do so. This was attributable in a large measure to the increased price of coal. What was a manufacturer going to do if he dispensed with his gas supply? How was he going to work his concern? If he installed his own plant, he would find that coal was dear; while if he introduced electric light he would find that very dear also, and it was still going up for manufacturing purposes. In his opinion, he would soon come back to gas. If they withdrew from the Gas Committee the extraordinary charge of finding money for the relief of the rates, then they would not have to increase the price of the gas. The Committee had an unfair burden in this way. The 6d. was not a permanent advance. Directly there was an opportunity to reduce the price, it would be reduced.

Alderman FAWCETT supported the Committee, and claimed that an increase of 6d. was not going to cover the whole of the difference. They could reconcile themselves to the prospect of an increased charge for electricity as well.

Mr. OLDFIELD said the Council must either relieve the Committee of their imposts or the consumer must pay a higher price for gas. To his mind it would be better to pay a big price for gas than allow the amount to come on to the rates. There were some members of the Committee unprepared to raise the price 6d. for power purposes; but they thought, considering the price of coal, that even power users would not complain, during the emergency, at paying the additional charge.

The MAYOR (Alderman W. H. Ingham) said the question was a simple one. Had the price of coal gone up to such an extent as to warrant the Committee advancing the price of gas to the degree proposed? As a gas consumer, he felt that they could not expect to get off without some increase.

Mr. REDMAN said the increased price of coal accounted for the whole of the 6d.; while, in addition, they had to remember that the Committee could not sell the residuals. He did not share the view that they would lose their customers.

The amendment was lost; and the minutes were adopted.

GAS-METER TESTING IN MANCHESTER.

Testing High-Pressure Gas-Meters and Meter Indices.

The Official Inspector of Gas-Meters for the City of Manchester (Mr. S. Dyson) has submitted his report for the year ended the 31st of March, with statistics relative to the working of the department.

Mr. Dyson remarks at the outset that, owing to the increasing use of high-pressure gas both for lighting and industrial purposes, it is important that statutory powers should be obtained for testing high-pressure gas-meters. In 1912 the Justices' Gas-Meter Testing Committee communicated with the Board of Trade on the subject, and pointed out the necessity for such regulations. But as regards Manchester no definite result has yet been arrived at. The London County Council and the Corporation of London both obtained parliamentary powers last session enabling them to provide suitable apparatus for testing high-pressure meters; and the Acts came into force on the 1st of April this year. Should the powers obtained by the London authorities prove satisfactory, it is expected that the Board of Trade will take steps to extend them to authorities generally. In Mr. Dyson's opinion, the testing and stamping of gas-meter indices should be made compulsory. He has on former occasions reported having found meters registering incorrectly owing to wrong indices being attached thereto. In 1902 the Committee instituted the "index test," which is applied to all meters when requested. In the absence of this safeguard, there is nothing to prevent the accidental or wilful substitution of incorrect indices, with the consequent gross error in the registration of such meters.

During the past year a five-light meter which was tested and stamped fifteen years ago (before the index test was instituted by the Committee) was returned to the office for re-examination. On applying the "index test," it was found to be 40 per cent. fast, owing to a ten-light index being affixed to it. Another five-light meter was tested in the office three years ago, and both the index and the measuring chambers were found correct, and separately sealed. The meter has since been in use in another town, where it was recently submitted for re-testing, and was reported to be registering 61 per cent. fast. On inquiries being made, it was found that subsequent to the test in the Manchester office an incorrect index had been substituted by a workman to whom the meter had been entrusted for repairs. It was afterwards put into use without being re-verified.

The number of meters tested during the year amounted to 40,666; showing a decrease of 3307 compared with the previous year. The fees received (including bank interest, less commission) amounted to £1615 10s. 9d.—being a decrease of £119 15s. 6d. The expenditure for the same period was £1936 1s. 6d.; showing a debit balance of £320.

The appendices to the report show that 689 meters, or 1·69 per cent., were rejected. Of the 5387 wet meters tested, 98, or 1·81 per cent., and 591, or 1·64 per cent., of the 35,279 dry meters tested, were rejected. The number of prepayment meters tested during the year was 21,999, or 54·09 per cent. of the total number; the remaining 18,667 being meters of the ordinary type.

For the last thirteen years the "index test" has been applied to all the Corporation meters passing through the office. During the past year 14,105 dry meter indices, and 2152 wet meter indices were tested; the fees received for them amounting to £379 10s. 6d. Out of a total of 16,257 indices tested during the year, eight were found incorrect.

ENCOURAGING THE USE OF GAS.

A Burnley Report.

There has been presented to the Gas Committee of the Burnley Corporation by the Engineer (Mr. J. P. Leather) a report regarding the use of gas for various purposes and the system of supplying appliances. Dealing with the matter under the heads of (1) the reasons for encouraging the use of gas for various purposes, (2) the history of the past in relation thereto, (3) some information as to the practice of other towns, and (4) suggestions as to what should be done in Burnley, Mr. Leather makes the following remarks.

It has been recognized in most industries involving processes requiring high temperature that a gaseous fuel is desirable if the best results are to be obtained. For this purpose, plants on a large scale have been erected for the manufacture of Mond gas, producer gas, or other form of gaseous fuel. The advantages are constancy of result, unaffected by the variations caused by the addition of cold, solid fuel or the clearing out of clinker and ash, ease of starting, regulating, or ceasing work, and cleanliness. These advantages—so very important in engineering work on the large scale—have their corresponding importance in the more restricted domain of the household or small business. In addition, however, to the economic benefits, there are further considerations of cleanliness and health which should appeal strongly to a municipal authority. Coal gas is "purified coal"—*i.e.*, coal freed from ash, from the heavy hydrocarbons which cause smoke, and from all but a trace of sulphur. If gas were used for all the purposes for which at present coal is employed, there would be much less of the dirt and dust which add to the discomfort of town life; while the diminution of the sulphuric acid which goes into the air from our chimneys would clear the atmosphere of one great cause of fog. For this reason, the use of gas should be encouraged, not only as the cheapest source of light, but for cooking, heating water for baths, &c., for gas-fires, for laundry work, for motive power, for melting, welding, brazing, soldering, and annealing metals, for tempering tools, and for innumerable other purposes in a large number of trades. Gas has been used for cooking and heating in a variety of ways for over half-a-century; but there are still numerous people who are not aware of the many purposes for which they might use gas to their own advantage.

In 1883, the Committee decided to deal in apparatus for cooking and heating by gas; it being evident that the public needed greater facility for the purchase of such apparatus than had been, or could be, given by private tradesmen. Consumers of gas were given the option of direct purchase on reasonable terms, purchase by instalments extending over three years, or hiring the apparatus from the Corporation. In practice, the last method led to difficulties necessitating a certain amount of restriction. Speaking generally, we have found that the bulk of our consumers prefer to own their stove; and most of our business is done on this basis. During the term when instalments are being paid, all ordinary repairs and attention are given freely by the department. This service, I think, should be further extended.

The amount of business done is indicated to some extent in the annual reports of the number of cookers and gas-fires fixed. The use of gas for cooking, laundry, and trade purposes is fairly constant throughout the year, thus tending to level-up the summer and winter consumptions. At the same time, the introduction of the incandescent burner has enabled consumers to obtain much more light for the same quantity of gas; leading in the case of weaving-sheds and some other businesses to a reduction in the consumption to one-half, or even one-fourth, of

that prevalent 23 years ago. It is seen that, while the annual make was only 151 times the largest daily consumption, it is now 218 times. The gas consumed in December used to be more than 15 per cent. of the whole; it is now only 11 per cent. On the other hand, the consumption in June is now 6·3 per cent., compared with 3·3 per cent. 25 years ago. The number of meters has doubled during the period covered by the return. The average consumption per meter decreased from 1889 to 1898—partly on account of the use of incandescent burners, and partly from the considerable increase in the number of small consumers due to the introduction of the prepayment meter in 1895—but it has recovered and exceeded its old figure during the last few years.

In 1904, the Committee decided to supply gas at a reduced rate for motive power. Since that time the quantity of gas used for this purpose has increased to nearly three times its former amount; the percentage of our total make having doubled.

Considering the large proportion of our consumers in Burnley who already use gas for cooking, I do not think great advantage would accrue from any drastic reduction in the terms on which apparatus is supplied. No profit is made on the sale of cookers, as the 10 per cent. added to the price after deducting the cost of fixing does not cover the cost of selling and handling in the store-room. I wish, however, to suggest that the cost of piping, stove-stand, &c., at present charged as extras, should be included in the cost of the cooker or other appliance. Further, I suggest that it be understood that the Gas Department keep all cookers and burners in repair as regards fair wear and tear, whether the property of the consumer or of the Corporation, without any charge for visiting the premises or for time taken in adjusting and putting them in order. Any materials used or parts replaced on a consumer's apparatus would, of course, be charged for. The meaning of this is that the Corporation are more than mere suppliers of a commodity. We supply light, heat, and power; and it is our duty to see that the consumer gets the proper result and satisfaction from the gas he uses. I may say that this is coming to be recognized by most gas undertakings throughout the world, but it has never been definitely asserted or approved by the Committee.

It would also be well to have a systematic inspection of all gas apparatus, to see that it is being used properly, and to the advantage of the consumer. Some gas undertakings have employed a lady inspector to visit all cookers. Such an inspector could give advice as to the use of the cooker, see if it is in proper order, and, if found out of order, report to the office, so that a fitter could be sent. About thirteen years ago, I sent a man round the town to visit every gas consumer. He was instructed to ask if they had a gas-cooker, and (if so) whether it was giving satisfaction. Even if an affirmative answer was given to both these questions, he asked to see the apparatus, and lighted the burners. In many cases, he found that, though the people had expressed satisfaction, he was able to make great improvement in the duty of the stove. This was highly appreciated by the user, who had not previously known the possibilities of the apparatus in her possession. A systematic inspection of this kind might lead to greater satisfaction and increased use of gas.

Upon this report, the Gas Committee resolved that the suggestion of the Engineer that the cost of piping, stove-stand, &c., should be included in the charge made for the appliances to which such piping, &c., is an accessory, be adopted; and that the further consideration of the matters referred to be deferred.

ILKESTON GAS SUPPLY.

Some acrimonious talk, which is not unusual in connection with debates in the Ilkeston Town Council, was indulged in at the meeting last Tuesday evening, arising out of complaints as to the character of the gas supply. It had been decided by the Gas Committee that, until some satisfactory answer had been received to their previous representations on the subject, no official advertisements should be inserted in a local newspaper, which, it was alleged, had "so ruthlessly slandered a department which was making profits for the ratepayers."

There having been discoveries of serious leakage of gas of late, the Mayor (Mr. J. A Macdonald) afforded the information, in moving the adoption of the minutes of the Committee, that 312 joints had been laid bare in connection with a main to the Little Hallam gasholders, and no fewer than 294 had been found to be defective. The repairs having been effected, it was now possible to fill the holder in five hours, instead of eight hours as hitherto. Mr. A. Henshaw directed attention to the way in which street-lamps went out of their own accord. Mr. W. Smith supported Mr. Henshaw's criticism.

Ultimately the Mayor withdrew the resolution in the Gas Committee's minutes referring to a complaint made by Mr. Henshaw, saying that the version given by that gentleman was contrary to the facts; but he did not wish to cast any slur on him. He was glad the discussion had arisen, because it afforded him the opportunity of denying that anything in the nature of bad gas was supplied by his Committee.

Subsequently Mr. W. Smith moved that the minutes referring to the withholding of official advertisements from a local newspaper should not be confirmed, urging that the proposal to boycott the newspaper was next door to blackmail. The resolution, he contended, was the result of petty spite, and was a disgrace to the man whose brain had evolved such an ignominious idea. Mr. E. Smith seconded; but Alderman Moss supported the action of the Committee. Mr. W. Smith, referring to the attendance of police at the meeting, asked the Mayor if they were present at his invitation; but the Mayor declined to answer the question. Mr. Henshaw condemned the Committee's proposal as to the withdrawal of advertisements; and Mr. Manners also declined to be allowed to be associated with the suggested boycott. The Mayor said that the Committee had no desire to boycott the newspaper in question; but they were not prepared to allow any paper

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to slander or malign the Corporation. The remarks which had been published were slanderous and damaging to a degree. Not only did the newspaper referred to say they supplied bad gas, but it insinuated that, as a result of buying cheap coal, they made cheap coke, and could not get a good price for it. Mr. W. Smith was attempting to interpose, when the Mayor said if he did not behave himself he would be turned out. To give the newspaper proprietors affected a further opportunity to reply to the letters which had been forwarded to them on behalf of the Gas Committee, the Mayor withdrew the minute to which objection had been taken, and the subject dropped.

There was, however, subsequently a further scene arising out of the decision to discuss in committee another resolution of which notice had been given by Mr. W. Smith, claiming the right to take a copy or extract from the opinion of Counsel (Mr. W. C. Tyldesley Jones), who had been consulted with reference to the supply of electrical energy for photographic purposes at the same rate as charged for power—this permission having been refused by the Town Clerk, unless Mr. Smith gave an undertaking to treat the opinion as strictly private and confidential. The proposal to deal with the matter in private was resented by Mr. Smith, who complained that he had been served a nasty trick. That proceedings of a very angry character were witnessed in committee may be surmised from the fact that Mr. W. Smith was next seen in the street hatless and struggling; he having, it is understood, been ejected for refusing to withdraw an observation to which exception was taken by the Mayor.

The "Ilkeston Pioneer," which it had been proposed to exclude from the list of newspapers receiving official advertisements, formulated complaints originally as to the quality of the local gas supply, and insisted on the necessity for rigid investigation; contending that events subsequent to the time when it first brought the matter under notice have afforded ample justification for the representations made.

Gas Company's Rebate in Westminster.—It was reported at the last meeting of the Westminster City Council that the Gas Light and Coke Company, in rendering their account for public lighting during the quarter ended March 25 last, had made the Council an allowance, without prejudice, of £500 in respect of the reduction of lighting. The allowance on the previous occasion was £700; but, upon inquiry, the Works Committee had been informed that this amount included an allowance of £116 in respect of the September quarter. The Company pointed out that the lighting hours during the March quarter were about 10 per cent. less than during the December quarter; and as the allowance was based on the saving effected on the quantity of gas not consumed by reason of the reduced lighting, the quantity not consumed became relatively less with the approach of summer. The cost of repairs to globes had lately doubled, and mantles had gone up in price. In the circumstances, bearing in mind the rights and obligations of the Company and the Council respectively under the contract for public lighting, the Works Committee recommended the acceptance of the offer, which course was unanimously adopted.

NOTES FROM SCOTLAND.

From Our Own Correspondents.

Saturday.

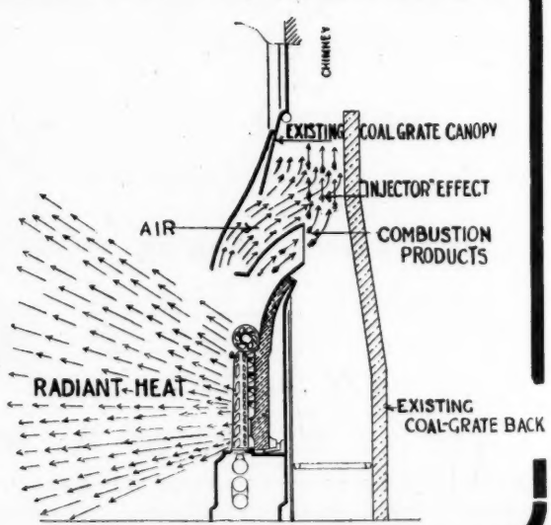
On Monday night a fire broke out in a store belonging to the Coatbridge Gas Company, situated about 100 yards from the large gasholder. The store, which was a wooden erection with slate roof, was used for repairing gas-stoves, and was stocked with about £300 worth of tools. The Fire Brigade was called; but the building, despite all efforts, was completely gutted. The loss is estimated at about £500, and is partially covered by insurance.

A serious outbreak of fire occurred early on Wednesday morning in the warehouses of the Orchard Sugar Refinery at Greenock, and as a result the buildings were completely gutted, and a large quantity of refined sugar was destroyed. A rough estimate of the damage puts the amount at fully £20,000. The outbreak was discovered by the night watchman, who shortly before 2 a.m. was alarmed by the sudden extinction of the electric lights. In searching for the cause, he found that fire had broken out in the dynamo-house. He summoned the Burgh Fire Brigade, and on their arrival within a few minutes it was seen that the flames had gained a very firm hold of the structure. A fairly strong wind favoured their rapid spreading, and very soon the whole of the warehouse was ablaze. The chief building is four storeys in height, and little now remains but the walls surrounding a mass of *débris*. It is thought that the cause of the fire was the fusing of an electric wire.

A discussion took place at a meeting of the Aberdeen Town Council on Wednesday in regard to the Provisional Order which is being applied for by the Council in connection with an improved water supply, at a cost of about £500,000. Dean of Guild Meff moved that, in view of the national crisis and the inadvisability of incurring capital expenditure, no further steps should be taken regarding the application. He argued that it would be a gross blunder to enter into so gigantic a scheme at present, and in view of the financial state of the country. Mr. William Stewart, the Convener of the Water Committee, moved the previous question; pointing out that the Water Committee had no idea of immediately expending half-a-million of money as suggested. They only asked for powers to proceed with the water scheme; but it would be 1919 before a penny of the borrowed money would be spent. He also claimed that the Government had encouraged public bodies to look forward with the view of providing employment which could be entered upon after the war was over. Dean of Guild Meff's motion was defeated by 23 votes to 4.

Rise in Price at Darwen.—In consequence of the higher price that has to be paid for coal, the Darwen Gas Committee have decided that, as from July 1, the charge for gas shall be increased by 6d. per 1000 cubic feet.

COMPLETE ROOM
VENTILATION
THIS IS ONLY ACHIEVED BY
WRIGHT'S
PATENT
'INJECTOR-VENTILATING'
GAS FIRES.



CURRENT SALES OF GAS PRODUCTS.

The London Market for Tar, Tar Products, and Sulphate.

LONDON, *May* 10.

There is no change to report as regards pitch; the price still remaining at about 25s. per ton, net, in bulk, at makers' works. Benzol continues in good demand, also solvent naphtha; but of the latter there is not much offering. Creosote is firm at 4½d. per gallon, net, in bulk, at makers' works; 40-45 per cent. anthracene is 2½d. per unit, casks free; and 60's crude carbolic is about 3s. 6d. to 3s. 7½d. per gallon, casks free.

The prompt value of 25 per cent. sulphate of ammonia remains as last reported—viz., £13 7s. 6d. per ton, net, at makers' works, into buyers' bags. For the second half of the year the position is stronger, and makers have advanced their price to £13 5s. per ton.

Tar Products in the Provinces.

May 10.

There is little or no alteration in the markets for tar products. Pitch remains steady, but not very much business is reported. Benzols are steady, and fair prices are being paid. Solvent and heavy naphthas are in very good demand, and high prices are realized. Creosote is quiet, and contracts are reported at very reasonable figures. Crude carbolic is firm.

The average values of gas-works products during the past week were: Gas-works coal tar, 21s. 3d. to 25s. 3d. Pitch, East Coast, 21s. to 22s.; Norfolk, Suffolk, and Humber ports, 18s. to 19s. per ton; West Coast, 19s. to 20s. Manchester; 20s. to 20s. 6d. Liverpool; 23s. to 24s. Clyde. Benzol, 90 per cent., naked, North, 10½d. to 11d.; 50-90 per cent., naked, North, 1s. 3d. to 1s. 4d. Toluol, naked, North, 2s. 2d. to 2s. 4d. Crude naphtha, in bulk, Nortb, 5½d. to 5⅝d. Solvent naphtha, naked, North, 1s. 5d. to 1s. 6d. Heavy naphtha, naked, North, 11d. to 1s. Creosote, in bulk, North, 3d. to 3⅛d. Heavy oils, in bulk, 3⅝d. to 4d. Carbolic acid, casks included, 60 per cent., East and West Coasts, 3s. 4d. to 3s. 5d. Naphthalene, £8 to £16; salts, 75s. to 85s., bags included. Anthracene, "A" quality, 2d. per unit; "B" quality, nominally ¾d.

Sulphate of Ammonia in the Provinces.

LIVERPOOL, *May* 8.

During the past week the tone of the market has continued strong, and a further advance in values has taken place in all quarters. There has been more inquiry from buyers abroad, as well as for Home consumption, and dealers are still showing themselves eager to secure parcels offered for sale. The prices are now £13 12s. 6d. per ton f.o.b. Hull, £13 13s. 9d. per ton f.o.b. Liverpool, and £13 17s. 6d. per ton f.o.b. Leith. For delivery over the second half of the year, £13 15s. per ton at the best ports has been realized repeatedly, and some producers are now holding for £14 per ton; but so far the latter figure has not been reported as having been paid.

Nitrate of Soda.

No further advance has been recorded in the price of this article, but holders on spot have remained very firm at 13s. per cwt. for ordinary quality, and 13s. 3d. for refined.

Sulphate of Ammonia.

From another source it is reported that the market has remained steady throughout the past week, but very little fresh business is reported, and prices remain about the same. Outside London, makes are quoted at £12 15s. to £12 17s. 6d.; Hull, £13 7s. 6d. to £13 10s.; Liverpool, £13 10s.; Middlesbrough, £13 10s.; Leith, £13 12s. 6d.

COAL TRADE REPORT.

Northern Coal Trade.

The coal trade has been startled by the proposal to restrict the exports of coal to neutral countries; but it is yet in doubt as to the conditions. Locally it may be said that the export from north-eastern ports—those from Blyth to West Hartlepool—average about 1,400,000 tons monthly—that is, the direct exports to foreign countries, and there are further some 450,000 tons monthly sent for use by steamers in foreign trades. It will be seen that the extent of the exports is important. The announcement of the intended restriction has not so much altered prices as checked forward business. In the steam coal trade, best Northumbrians are still about 26s. 6d. per ton f.o.b., and second-class steams are 24s. Steam smalls are firm at 14s. 6d. to 17s. per ton. Production is fairly good, and is at present readily taken up. In the gas coal trade, the demand is steady. Best Durham gas coals are about 23s. 6d. per ton f.o.b.; but there are many contracts being delivered at much lower prices. Second-class gas coals are about 21s. 6d. per ton, and "Wear Specials" about 24s. But these must be looked on as nominal prices, as little business will be done until there is some settlement as to the extent of any restriction of the exports. Tonnage is in average supply; but the collieries are now booked-up to the end of next week, and will not at present take on fresh orders, unless for home use. In coke, there is a steady inquiry. Good gas coke is from 19s. to 20s. per ton f.o.b. in the Tyne. Stocks of gas coke seem to be generally in course of reduction.

The Alliance and Dublin Consumers' Gas Company have notified the Kingstown and Blackrock Urban District Councils that they intend to terminate their agreements with these bodies, with a view to making increased charges.

Supplies for the Army and Navy.

Tempering and colouring cartridge clips in Richmond's Patent Natural Draught Oven Furnaces.

THE Richmond GAS STOVE & METER Co. Ltd.

The Leading & Largest Firm of Furnace Makers.
Warrington and 132, Queen Victoria Street, E.C.

Pollution Case at Ashbourne.

At the Ashbourne Petty Sessions last Thursday week, the Ashbourne Urban District Council were summoned, at the instance of the Trent Fisheries Board, for causing to flow, and knowingly permitting to flow, into the Henmore Brook, gas tar and ammoniacal liquor to such an extent as to poison fish. There were many witnesses, who deposed that, on Feb. 1, 38 dead trout and grayling were recovered from the Henmore Brook, which flowed past the Ashbourne Gas-Works. A Fisheries Board Inspector stated that on Feb. 3 he followed the stream up from Clifton Station to the gas-works, and saw traces of tar at various points. In some places lumps of the substance were clinging to branches which were touching the water. On reaching the gas-works, he examined a pipe which emptied towards the stream, and here he found matter of a tarry nature oozing out. For the defence, it was shown that there was no connection either by the tar-tanks on the premises or the sulphate of ammonia plant with pipes emptying towards the brook; and neither the Manager nor any of the staff had any knowledge as to how the tar got into the stream. The Bench, however, considered the case proved, and imposed the maximum penalty of £5, with £25 towards the costs.

Brighouse Finances.—That the trading departments had all had disappointing results was the statement made by Alderman Brown (the Chairman of the Finance Committee) at a special meeting of the Brighouse Town Council. He added that the Gas Committee, who had been expected to contribute £700 to the relief of the rates, had, in consequence of the increased cost of coal and the diminished price of residuals, only made a profit of £50, which had been devoted to the reserve fund. The Water Committee were expected to contribute £500, but had only £307 available; there having been a greatly diminished consumption of water owing to the recent strike in the silk trade, which was still very much affected by the war. The Electricity Committee had given £300, or £50 less than had been expected. The Corporation decided to increase the price of gas 3d. per 1000 cubic feet from July next, making the net price 2s. 7d.

Carnarvon Gas-Works Results.—The annual report of the Gas Committee, which was submitted at a meeting of the Carnarvon Town Council last Tuesday, showed that the income from the sale of gas remained practically the same as for the previous year, notwithstanding a reduction of 3d. per 1000 cubic feet for gas through ordinary meters, and the refund of 1d. in the shilling in respect of slot-meters. The net result for the year was a profit of £100, which meant that the gas was being supplied and the coke sold at the bare cost of production. Alderman Robert Parry (Chairman of the Committee) observed that there was not a very bright outlook for next year, as in all probability there would be an increase of from 4s. to 6s. per ton in their coal contract. He also feared that for the next quarter there would have to be an increase of 3d. per 1000 cubic feet in the price of gas, which would be a reversion to the state of things as they prevailed twelve months ago.

Fire at the Belfast Gas-Works.—An outbreak of fire occurred on Friday night on a platform running along the roof of the Belfast Corporation Gas-Works in Ormeau Road. The fire brigade were, however, quickly on the spot, and the flames were extinguished before any damage of consequence had been done.

Dewsbury and the Price of Coal.—At a meeting of the Dewsbury Town Council last week, Mr. T. Myers congratulated the Gas Committee on having taken prompt action to prevent unnecessary increases in the price of coal, and quoted statistics showing that if the price was raised by 5s. per ton, as had been suggested, it would mean an extra payment, as against last year, of £7000—representing an equivalent of 1s. to 1s. 2d. in the pound added to the rates.

Tarapaca Water-Works Company.—The net profit of this Company for the past year amounts to £38,681, which, added to the balance brought forward and allowing for income-tax, makes a total of £50,706 to the credit of profit and loss. An interim dividend was paid in October at the rate of 8 per cent. per annum; and the Directors recommend a final dividend of 4 per cent., making 8 per cent. for the year, and the placing of £10,000 to the reserve fund. This will leave a balance of £21,506 to be carried forward.

Additional Capital for the Redhill Gas Company.—It will be seen, from an announcement which appears elsewhere, that the Company are inviting tenders for an issue of £5000 of ordinary "B" stock, ranking for a dividend of 5 per cent. subject to the sliding-scale. The Company's statutory powers cover an area of 98 square miles; and the population of the parishes already supplied exceeds 32,000. The number of consumers is now 5200; while the consumption of gas last year exceeded 141 million cubic feet. The minimum price of the stock has been fixed at par; and tenders for it will be received at the Company's offices, Redhill, up to noon on the 1st prox.

South Barracas (Buenos Ayres) Gas Company.—The accounts for this Company for the year ended Dec. 31 last, which will be presented at the general meeting on the 20th inst., show a balance of £4251. Adding the amount brought forward, £1287, there is produced a sum of £5538. From this is deducted £4606, the interest on loans and advances; and there is left an available balance of £932, which the Directors recommend should be carried forward. The Directors regret to report a considerable decrease in the business done during the year, owing to the results of the financial crisis in the Argentine Republic and the corresponding depression generally. The war in Europe has also set back the hopes that were reasonably entertained of an improvement in gas consumption. The whole of the year under review was one of anxiety, both in Argentina and at home. The total decrease in the sales of gas during the year amount to 11,029,000 cubic feet, due almost entirely to the effects of the economy enforced upon the Company's consumers, as out of a total of 5385 meters in use for light and cooking at the beginning of the year there was a decrease of only 331. During the earlier part of the year small extensions of mains, to the extent of 2½ miles, were made into new districts.

SAWER AND PURVES

MANUFACTURERS OF PREPAYMENT AND ORDINARY METERS.

Wet or Dry.

FIRST IN 1889.

Any Coin.

FOREMOST IN 1915.

MILES PLATTING, MANCHESTER.

Wires: SAWER MANCHESTER. NOTTINGHAM.

'Phones: 3289 CITY, MANCHESTER. 2025 NOTTINGHAM.

RADFORD ROAD, NOTTINGHAM.

Birmingham Corporation and Disabled Soldiers.

A proposal of the General Purposes Committee which was adopted at last week's meeting of the Birmingham City Council was to the effect that all Corporation employees who have joined the forces and have been discharged as unfit for service, and who are unable to follow their previous occupation, shall be paid, for a period not exceeding six months from their discharge, the difference between the amount of any pension or allowance received by them from the Government and their wages under the Corporation. One member, under the impression that if it were agreed to the matter would be closed finally, moved an amendment that the subject should be referred back for further consideration. He suggested that the obligation of the Council to the men was not discharged by making the suggested payment; and he thought a Special Committee should be appointed to deal with what was a new and difficult social problem. It was, however, explained that the proposal was only intended as a temporary measure, until more information was available.

Prohibiting Competition for Employees.

Regulations of a stringent character have been issued by the Board of Trade to prevent employers in certain trades directly connected with armaments trying to get men away from one another. They do not in any way prevent an employer from engaging a man who applies to him on the ground that the man has just left Government work. In so far as men move from one employer to another, they will be free to do so. All that is intended is to prevent attempts by the employers themselves to encourage this movement by advertisement, by sending round agents, or otherwise. The regulation does not affect the mere offering of higher wages by an employer. The regulations are in the following terms: "The occupier of a factory or workshop the business carried on in which consists wholly or mainly in engineering, shipbuilding, or the production of arms, ammunition, or explosives, or of substances required for the production thereof, shall not, nor shall any person on behalf of the occupier of such a factory or workshop, either directly or indirectly, by canvassing, advertisement, or otherwise, take any steps with a view to inducing—(*a*) Any person employed in any other factory or workshop, being a person engaged on work for any Government Department or otherwise serving war purposes, to leave his employment; or (*b*) any person resident in the United Kingdom at a distance of more than 10 miles from the occupier's factory or workshop to accept employment therein, otherwise than by notifying vacancies to a Board of Trade Labour Exchange."

The value of gas in the home is once more emphasized by Messrs. R. & A. Main, Limited, in two recent publications issued by them bearing the titles of "The Main Stay of Home—the New Main Cooker" and "Concerning Main Cookers—the Key to Home Comforts." Both booklets have the same artistic cover.

Omagh (Co. Tyrone) Gas Undertaking.—The report of the Auditors of the accounts of the Omagh gas undertaking shows that the profits on the past year's working amount to £1439—a decrease of £67 on the previous year. Coal cost £73 more, and there was a further extra expenditure of £77.

Issue of Capital by the Bournemouth Gas and Water Company.—An announcement will be found in our advertisement columns to-day of a sale by tender of such number of "B" 7 per cent. shares of £10 each in the Bournemouth Gas and Water Company as will, with the premiums thereon, produce not more than £13,361 4s. 7d. Tenders must be sent in not later than the 20th inst.

Output of Gas at West Bromwich.—Submitting the report of the Gas Committee at a meeting of the West Bromwich Town Council last Wednesday, Mr. Brockhouse referred to the results of the past year's working, which were very favourable. He mentioned that the sales of gas were 396,894,584 cubic feet, including public lighting, an increase of 28,971,417 cubic feet compared with the previous year, and that in the amount of gas-rental there was a satisfactory increase. He remarked that great credit was due to their Engineer (Mr. W. H. Johns) for the way he had gone about his work. This was a record year in the history of the undertaking, and he hoped they would have a further record to report next year.

Ottoman Gas Company, Limited.—At the half-yearly ordinary general meeting of the Company, to be held to-day, the Directors will not, owing to the war, present the usual report and accounts. They have, however, decided to recommend a distribution from the reserves of the Company of a dividend at the rate of 7 per cent. per annum on the preference shares (less income-tax) and at the rate of 2 per cent. per annum on the ordinary shares (tax free), making 6 per cent. for the year. The Board announce with regret the death last December of Mr. H. Ward Andrews, one of their colleagues. The vacancy thereby created has been filled by the election of Mr. A. F. Phillips, who, in consequence, retires from the position of Consulting Engineer.

Coal Contracts at Birkenhead.—At the last meeting of the Birkenhead Town Council, Mr. Wilson, in accordance with notice, moved: "That a Special Committee, to be called the Coal Contracts Committee, be appointed (1) to examine and consider all tenders for coal and fuel and the carriage thereof recommended for acceptance by the various Committees, including those recommended in minutes presented to the Council to-day; and (2) to examine all prices paid for fuel during the last six months; and that no contracts for fuel be signed without the approval of such Committee." Mr. Wilson said the present expenditure of the four main coal-consuming Committees of the Corporation was something like £70,000, while the other Committees spent something like £3500 on coal—making the total amount paid for coal by the Corporation £74,000. There was a possibility that the price would increase by 25 per cent., which would bring up their coal bill to £92,000. He thought that if such a Committee as he proposed were formed they would be able to obtain better contracts. The motion was carried by 19 votes to 8.

"SPECIAL SAXON."

Heavy Copper, Brazed Joints.
The best pattern for
soft water districts.

PS

"PARKINSON" CIRCULATORS

"NORMAN."

Cast Iron. No Joints.
Substantial and highly efficient.

THE PARKINSON STOVE CO., LTD.,

Incorporating Maughan's Patent Geyser Co. (Originators of Geysers).

BIRMINGHAM & 129, HIGH HOLBORN, LONDON, W.C.

Increased Output at Oldbury.—It was reported at a meeting of the Oldbury Urban District Council on Friday that the quantity of gas sent out during the twelve months ended March was 172,041,000 cubic feet against 165,389,000 cubic feet for the previous year—an increase of 6,652,000 cubic feet.

New Sulphate Plant for Strabane.—The Manager of the Strabane Gas-Works (Mr. T. Reilly) having reported to the Urban District Council that a new sulphate of ammonia plant is needed, it has been decided to obtain estimates. He considers that there is a loss of £150 per annum on the existing plant, and states that a new one could be purchased for about £200.

Raising Money by Bills.—When moving the adoption of the report of the Finance Committee at last Tuesday's meeting of the Birmingham City Council, Alderman Brooks said the Local Government Board had issued an order giving Birmingham power to raise money by means of bills to an amount not exceeding £2,000,000. Their power previously was limited to £500,000; and the amount now mentioned was the largest sum, he thought, at present sanctioned for any municipal body. The extension might be of considerable assistance to the city while passing through difficult financial conditions arising out of the war.

Exports of Coal.—The "Daily Mail" last Wednesday contained the following letter on the subject of coal exports from Mr. G. J. Eveson: "I see it announced in the newspapers that the Greek Government is in the market for 50,000 tons of Welsh coal, also the Italians for a still larger supply. To me it seems suicidal that these countries should be supplied at all (until, at all events, we know whether the coal is to be sold or transferred to an enemy or utilized against us, as coal we have supplied to Germany in the past is now being used), when English manufacturers are exploited with the terrific prices now in force. Is this Free Trade or Fair Trade? I care not which; but I think our celebrated coals should be kept for our Allies and for home consumption. Then there would not be so much talk about such extraordinary prices."

New Show-Rooms at Workington.—Excellent new gas show-rooms at Workington have been inaugurated by an exhibition of the latest and best gas appliances, with lectures and demonstrations given by Miss Tuxford. The Mayor (Alderman Walls) was present at the opening of the exhibition; and he was supported by the Chairman of the Gas Committee (Alderman Hall), who, in an appropriate speech, drew attention to the numerous advantages of gas, more particularly for cooking and heating. His closing remarks, which were as follows, indicate that nothing short of perfection is striven for in the administration of the Workington Corporation gas undertaking: "With regard to complaints, our object is to impress upon all consumers that they are conferring a favour upon us by bringing all complaints, no matter how trivial to us. Their troubles shall be our troubles; and it is only by doing this that we can hope to share in your satisfaction."

Dukinfield Gas-Works Accounts.—In his report on the working for the twelve months ended March 31, Mr. William Lindley, the Manager of the Dukinfield Corporation Gas-Works, says the carbonizing plant worked satisfactorily; the yield of gas per ton being 12,627 cubic feet. Sales of gas amounted to 93 million cubic feet, which was a decrease of 4 million feet on the preceding year. The unaccounted-for gas amounted to 9·25 per cent., as against 8·09 per cent. The net cost of gas per 1000 cubic feet sold, exclusive of capital charges, was 1s. 11·19d., in the past year, as compared with 1s. 6·89d. twelve months ago. The result of the operations—which were, of course, affected by the abnormal conditions prevailing—is a gross profit of £1137, against £3006, and a net deficit of £1965, compared with a net profit in 1914 of £9. With the amount of surplus brought forward from the previous year, there is a balance on the profit and loss account of £2277.

Lamp Extinguishing on Emergency.—In a letter to the Watch Committee, with reference to the method of darkening the town in case of a sudden emergency, the Tunbridge Wells Gas Company pointed out that the turning-off of the gas at the main would not have the desired result of quickly plunging the town in darkness, as the mains would be fully charged with gas, and the lights placed in the higher levels would remain burning for a considerable time. There would, moreover, be considerable danger of explosions when the supply was resumed, as many of the consumers would neglect to turn the taps off. The Directors felt that it would be better for the street-lamps to be individually extinguished; and this could best be done by the Fire Brigade, whose chief would be the first to hear from the military. The Directors would be prepared to bear the expense of this. The Committee resolved that the Fire Brigade be allowed to assist in the way suggested.

APPLICATIONS FOR LETTERS PATENT.

6187.—Stephens, C., "Gas-stoves." April 26.
6199.—Pearce, R. F., "Collection of matter suspended in gas." April 26.
6215.—Wadman-Smith, C. J. P., "Treatment of coal gas." April 26.
6250.—Adams, M. J. & A. H., "Meters." April 27.
6285.—Hollandsche Residugas Maatschappij Systeem Rincker-Wolter, "Manufacture of oil gas." April 27.
6312.—M'Court, C.D., "Combustion of gases and vapours." April 28.
6316.—Ward, S. A., "Coal-conveyors." April 28.
6346.—Bouchard, A.-C. A., "Controlling lamps." April 28.
6395.—Keith, J. & G., "Controlling lamps." April 29.
6414.—White, C., and Wells, J. F., "Treatment of coal and other tars, pitch, and the like." April 29.
6418.—Bateman, H. L., "Production of gas." April 29.
6450.—Lewis, G. P., "Preparing intermediate products from hydrocarbon and other distillates." April 30.
6509.—Halkett, R., "Gas and air mixing valve." May 1.
6548.—Compagnie pour la Fabrication des Compteurs et Matériel d'Usines à Gaz, "Prepayment meters." May 1.

Some Opinions
of the
Exhibition
Salons
60, Oxford St., London, W.

"Journal of Gas Lighting."

"These Art Galleries are going to be an influence for good for the Industry."

"A permanent Gas Exhibition worthy of a very great Industry." (1/12/14).

"Gas World."

"An excellent bit of work for the Gas Industry." (20/3/15).

"Gas."

"60, Oxford St., henceforth will be remembered for a definite and particular attraction by all coming gas men and by all those who have arrived." (23/12/14).

"Illustrated Carpenter and Builder."

"A useful and enterprising thing." (2/4/15).

"Building World."

"The most palatial Exhibition of Gas Cooking and Heating Apparatus to be discovered in the United Kingdom." (3/4/15).

Exhibition Booklet free on Request.

The Davis Gas Stove Co., Ltd.
LONDON, LUTON, MANCHESTER, PARIS.

Among the estimates for the year 1915-16 to come before the London County Council to-day are £10,110 for gas-meter testing and £4055 for gas testing.

The Directors of the Oriental Gas Company, Limited, have resolved to pay an interim dividend at the rate of 3½ per cent., less income-tax, on account of the year ending on the 30th prox.

The new season's cooker and geyser booklets of the Parkinson Stove Company, Limited, of Birmingham, make their appearance in inviting pictorial coloured wrappers, and contain particulars of the firm's many well-known types of gas apparatns. There are cookers suitable both for the largest and the smallest establishments; and the geysers illustrated also, of course, cover all sorts of requirements.

GAS COMPANIES IN THE STOCK EXCHANGE.

The Stock Exchange had a period of more or less tension throughout last week, culminating in a dramatic outburst of feeling evoked by the "Lusitania" horror. Acute points of interest had been the heavy fighting in our battlefields East and West—glorious, albeit costly in precious lives—the Budget question, the Drink-tax fiasco, with other things of lesser proportions; and these had conspired to repress activity and to infuse a tone of dullness, though not to any marked degree. But the dastardly crime committed on Friday against 2000 innocent men, women, and children of many peoples—some in amity with the perpetrators—brushed aside all thought of business, and kindled an intensity of feeling which sought utterance in one universal cry for vengeance. The materialized form which this may assume has yet to be seen; but the London Stock Exchange is a powerful corporation, and its voice will be heard. The market most affected during the week was the American, which had a rather considerable fall; but most others gave way to some extent, from the choicest gilt-edged downwards. Even the new South African issue felt the influence and was not fully subscribed—a feature for so good a security. The Gas Market pursued the even tenor of its way; and the prices realized for those issues in which transactions were recorded showed undiminished firmness. The Money Market continued very easy.

Bargains done for cash during the week were as follows: On Monday, Brighton and Hove "A" 141½, 142½, Gas Light Ordinary 88¼, 88⅜, 89½, ditto maximum 69½, 69⅝, ditto preference 87, ditto debenture 69, 69⅝, 69½, Imperial Continental 83¼, Primitiva preference 4½, 4⁹⁄₁₆, South Metropolitan 94, 94½. On Tuesday, Bombay 5¼, 5⅝, Bournemouth "B" 13¾, 13¹³⁄₁₆, Cape Town preference 4⅛, Commercial 4 per cent. 94, 95. Union 69, Gas Light preference 88, South Metropolitan 93½, 94½, ditto debenture 67. On Wednesday, Cape Town preference 4⅛, European 14⅛, 14⁵⁄₁₆, Gas Light ordinary 88¼, 88½, 88⅜, 89, 89¼, 89½, ditto preference, 87½, 87⅝, 88, ditto debenture 68⅜, 69, Primitiva preference 4½, 4⁹⁄₁₆, South Metropolitan 94½, 95, 95¼, 95⅛, 96. On Thursday, Commercial 4 per cent. 94½, 95, 96½, Gas Light ordinary 89, 89½, ditto preference 87½, 87⅝, ditto debenture 68¼, South Metropolitan 95, 95⅛, 96. On Friday, Cape Town 1⁵⁄₁₆, ditto preference 4⅛, Gas Light ordinary 89, 89¼, Imperial Continental 83, 83¼, 84, Melbourne 97⅜, 97½, Primitiva Preference 4½, 4⁹⁄₁₆, South Metropolitan 95, 95½, 96, South Suburban 100. On Saturday, Cape Town 1¼, Gas Light ordinary 89¼, 89½, Primitiva debenture, 90, 90¾.

LOWEST AND HIGHEST PRICES OF BARGAINS DONE FOR CASH IN THE WEEK ENDING MAY 8.

Issue.	Share.	When ex. Dividend.	Dividend or Dividend & Bonus.	NAME.	Closing Prices. July 30.	Yield on Highest Closing Price.	Lowest and Highest Prices of Bargains.
£			p.c.		£ s. d.		
1,551,868	Stk.	April 8	2½	Alliance & Dublin Ord.	59—64	3 18 2	..
374,000	,,	July 10	4	Do. 4 p.c. Deb.	76—79	5 1 3	..
280,000	5	April 29	7½	Bombay, Ltd.	5¼—6⅜	5 17 8	5½—5⁹⁄₁₆
50,000	10	Feb. 26	16	Bourne- 10 p.c.	29—30	5 6 8	..
373,480	10	,,	7	mouth Gas B 7 p.c.	15—15½	4 10 4	13½—13¹³⁄₁₆
95,000	10	,,	6	and Water Pref. 6 p.c.	13½—14	4 5 9	..
—	—	—	—	Deb.	..	—	..
380,000	Stk.	Feb. 26	14	Brentford Consolidated	261—266	5 5 3	..
330,000	,,	,,	11	Do. New	204—209	5 5 3	..
50,000	,,	,,	5	Do. 5 p.c. Pref.	109—111	4 10 1	..
206,250	,,	June 11	4	Do. 4 p.c. Deb.	91—93	4 6 0	..
217,380	Stk.	Feb. 26	11	Brighton & Hove Orig.	208—213	5 3 4	..
244,200	,,	,,	8	Do. A Ord. Stk.	154—159	5 0 8	141½—142⅜
630,000	20	Mar. 26	12½	British	44—45	5 11 1	..
120,000	Stk.	June 26	4	Do. 4 p.c. Deb. Stk.	88—90	4 8 11	..
945,771	Stk.	June 26	4	Buenos Ayres 4 p.c. Deb.	85—87	4 12 0	..
100,000	10	—	—	Cape Town & Dis., Ltd.	1½—2⅛	—	1½—1⁵⁄₁₆
100,000	10	—	—	Do. 4½ p.c. Pref.	4—6	—	4⅛—4½
100,000	Stk.	June 26	4½	Do. 4½ p.c. Deb. Stk.	70—75	6 0 0	..
157,150	Stk.	Feb. 26	5	Chester 5 p.c. Ord.	103—110	4 10 11	..
1,513,280	Stk.	Feb. 12	5/9/4	Commercial 4 p.c. Stk.	106—108	5 1 2	94—96½
660,000	,,	,,	5½	Do. 3½ p.c. do.	103—105	5 1 6	..
475,000	,,	June 11	3	Do. 3 p.c. Deb. Stk.	69¾—71¼	4 3 11	..
800 000	Stk.	,,	4	Continental Union, Ltd.	76—79	5 1 3	69
200 000	,,	,,	7	Do. 7 p.c. Pref.	115—118	5 18 8	..
—	—	—	—	Croydon B and C 7 p.c.	..	—	..
492,370	Stk.	—	6	Derby Con. Stk.	123—125	4 16 0	..
55,000	,,	—	4	Do. Deb. Stk.	102—104	3 16 11	..
1,009,180	10	July 29	10	European, Ltd.	17⅜—18	5 11 1	14⅛—14⁷⁄₁₆
16,364,910	Stk.	Feb. 12	4/17/4	Gas 4 p.c. Ord.	98—102	4 15 6	88½—89⅜
2,600,000	,,	,,	8½	Light 3½ p.c. max.	76—79	4 8 7	69¼—69⅝
4,062,235	,,	,,	4	and 4 p.c. Con. Pref.	90—99	4 0 10	87—88
4,674,850	,,	June 11	3	Coke 3 p.c. Con. Deb.	72½—74½	4 0 6	69¼—69⁷⁄₁₆
130,000	,,	,,	10	10 p.c. Bonds	..	—	..
258,740	Stk.	Mar. 12	5	Hastings & St. L. 3½ p.c.	87—89	5 12 4	..
70,000	10	April 29	11	Hongkong & China, Ltd.	16½—16⅞	6 11 4	..
—	—	—	—	Hornsey 7 p.c.	..	—	..
131,000	Stk.	Mar. 12	7½†	Ilford A and C	151—154	5 2 4	..
65,780	,,	,,	6½†	Do. B	115—118	5 8 0	..
65,500	,,	June 26	4	Do. 4 p.c. Deb.	92—94	4 5 1	..
4,940,000	Stk.	May 14	9	Imperial Continental	150—160	5 12 6	83—84
1,235,000	Stk.	Feb. 12	3½	Do. 3½ p.c. Deb. Red.	84—86	4 1 5	..
200,242	Stk.	Mar. 12	6½	Lea Bridge Ord. 5 p.c.	119—121	5 7 6	..
561,000	Stk.	Feb. 26	10	Liverpool 5 p.c. Ord. A	211—213	4 13 11	..
718,100	,,	,,	7	Liverpool 5 p.c. Ord. B	146—148	4 14 7	..
306,083	,,	June 26	4	Do. 4 p.c. Pr. Deb. Stk.	..	—	..

Issue.	Share.	When ex. Dividend.	Dividend or Dividend & Bonus.	NAME.	Closing Prices. July 30.	Yield on Highest Closing Price.	Lowest and Highest Prices of Bargains.
£			p.c.		£ s. d.		
75,000	5	June 11	6	Malta & Mediterranean	4½—4⅝	6 9 9	..
250,000	100	April 1	4½	Met. of Melbourne 4½ p.c. Deb.	99—101	4 9 1	97⅜—97½
541,920	20	May 28	4	Monte Video, Ltd.	11½—12	6 13 4	..
1,775,892	Stk.	July 29	4½	Newc'tle&G'tesh'd Con.	99½—99⅝	4 10 6	..
529,705	Stk.	June 26	3½	Do 3½ p.c. Deb.	82—83	4 4 0	..
55,940	10	Feb. 26	7/14/0	North Middlesex 7 p.c.	14—15	5 2 8	..
300,000	Stk.	May 14	8	Oriental, Ltd.	117—122	6 11 2	..
60,000	5	Mar. 26	10	Ottoman, Ltd.	7½—7⅝	6 9 0	..
60,000	50	Feb. 26	13	Portsea, Island B	128—131	4 19 3	..
100,000	50	,,	12	Do. C	118—121	4 19 2	..
52,000	50	,,	10	Do. D	..	—	..
249,980	5	April 29	8	Primitiva Ord.	5⅛—6	6 18 4	..
499,960	5	June 26	5	,, 5 p.c. Pref.	4⅞—5	5 0 0	4⅞—4⁹⁄₁₀
521,600	100	June 2	4	,, 4 p.c. Deb.	91—93	4 6 0	90—90⅝
—	—	—	—	,, ,, ,, 1911	..	—	..
346,198	Stk.	June 26	4	River Plate 4 p.c. Deb.	85—87	4 12 0	..
150,000	10	May 14	6	San Paulo 6 p.c. Pref.	10½—11	5 9 1	..
125,000	50	July 1	5	San Paulo 5 p.c. Deb.	47—49	5 2 0	..
135,000	Stk.	Mar. 12	10	Sheffield A	233—234	4 9 3	..
209,984	,,	,,	10	Do. B	232—234	4 9 3	..
523,500	,,	,,	10	Do. C	230—232	4 10 1	..
90,000	10	May 28	9	South African	10½—11½	7 16 6	..
6,429,895	Stk.	Feb. 12	5/9/4	South Met., 4 p.c. Ord.	111—113	4 16 8	93½—96
1,895,445	,,	July 10	3	Do. 3 p.c. Deb.	72½—74½	4 0 6	67
209,820	Stk.	Feb. 26	8½	South Shields Con. Stk.	157—159	5 6 11	..
952,795	Stk.	Feb. 26	6	S'th Suburb'n Ord. 5 p.c.	114—116	5 3 6	103
60,000	,,	,,	5	Do. 5 p.c. Pref.	110—112	4 9 3	..
—	—	—	—	Do. West Kent.	..	—	..
137,058	,,	June 26	5	Do. 5 p.c. Deb. Stk.	116—118	4 4 9	..
629,740	Stk.	May 14	5	Southampton Ord.	99—102	4 18 0	..
120,000	Stk.	Feb. 12	7½†	Tottenham A 5 p.c.	135—138	5 8 8	..
742,275	,,	,,	6†	District B 3½ p.c.	115—117	5 2 7	..
181,255	,,	June 26	4	District 4 p.c. Deb.	87—89	4 9 11	..
182,380	10	Dec. 30	5	Tuscan, Ltd.	5—6	8 6 8	..
149,900	10	July 1	5	Do. 5 p.c. Deb. Red.	93—95	5 5 3	..
236,476	Stk.	Mar. 12	5	Tynemouth, 5 p.c. max.	108½—109½	4 11 4	..
				Wandsworth, Wimbledon, and Epsom—			
80,000	Stk.	Feb. 26	8½	Wandsworth A 5 p.c.	151—156	5 7 4	..
255,636	,,	,,	6½	,, B 3½ p.c.	129—134	5 2 7	
108,075	,,	,,	5/17/8	,, C 3½ p.c.	110—115	5 2 0	..
353,000	,,	,,	6½	Wimbledon 5 p.c.	117—122	5 0 6	..
98,000	,,	,,	6½	Epsom 5 p.c.	121—126	5 5 9	..
88,416	,,	June 26	3	3 p.c. Deb. Stk.	66—69	4 6 11	..

WANTED, FOR SALE, CONTRACTS, &c., ADVERTISEMENTS IN THIS WEEK'S "JOURNAL."

Appointments, &c., Vacant.

LADY (CHARGE OF SHOW-ROOM, &c.). Stretford Gas Company. Applications by May 15.
ENGINEER. Kristiania Gas-Works.
ENGINEER, MANAGER, AND SECRETARY. Tawe Valley Gas Company. Applications by May 15.
GAS-WORKS SUPERINTENDENT. Accrington Gas and Water Board. Applications by May 12.
CHIEF ASSISTANT (GAS AND WATER), Barrow-in-Furness Corporation. Applications by May 17.
CHEMIST. No. 6035.
SLOT METER COLLECTORS. Alliance and Dublin Consumers' Gas Company.
RETORT-HOUSE FOREMAN. Stretford Gas Company.
CARBONIZING FOREMAN. No. 6037.
TURNCOCK AND INSPECTOR. Cheltern Hills Spring Water Company.

Plant, &c. (Second Hand), for Sale.

CENTRE VALVE AND STATION METER. Darlington Gas-Works.
"D.B." CHARGER. Hamilton Gas-Works.
PURIFIERS, &c. Rothwell Gas Company.

Plant, &c. (Second Hand), Wanted.

AMMONIA STILL. No. 6033.
"P. & A." TAR EXTRACTOR. No. 6036.

Sales of Stocks and Shares.

ALDERSHOT GAS, WATER, AND DISTRICT LIGHTING COMPANY. London Mart. June 1.
BOGNOR GASLIGHT COMPANY. London Mart. June 1.
BOURNEMOUTH GAS COMPANY. By Tender. May 20.
LEA BRIDGE GAS COMPANY. London Mart. May 18.
REDHILL GAS COMPANY. By Tender. June 1.

TENDERS FOR

Coal.

BARROW-IN-FURNESS CORPORATION. Tenders by May 18.
BRIDGNORTH GAS DEPARTMENT. Tenders by May 14.
DARWEN GAS DEPARTMENT. Tenders by May 22.
GOOLE URBAN DISTRICT COUNCIL. Tenders by May 26.
MANSFIELD GAS DEPARTMENT. Tenders by May 26.
MOSSLEY GAS DEPARTMENT.

Coal (*continued*).

RICHMOND (SURREY) TOWN COUNCIL. Tenders by May 28.
ROCHDALE GAS DEPARTMENT. Tenders by May 19.
SHERBORNE GAS COMPANY. Tenders by May 15.
STRETFORD GAS COMPANY. Tenders by May 20.
TIVERTON TOWN COUNCIL. Tenders by June 5.

Lime.

MANSFIELD GAS DEPARTMENT. Tenders by May 26.

Meters.

MANSFIELD GAS DEPARTMENT. Tenders by May 26.

Pipes.

SALFORD GAS DEPARTMENT. Tenders by May 19.

Retorts, &c.

MOSSLEY GAS DEPARTMENT.

Tar.

GOOLE URBAN DISTRICT COUNCIL. Tenders by May 26.
SALISBURY GAS COMPANY.

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See Illustrated Advertisement, Feb. 16, p. 364.

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